
THE SANITARY INSTITUTE, INCORPORATED 1888.
SALUS GENERIS HUMANI.

6/6

THE TEACHER'S
HANDBOOK OF PSYCHOLOGY

ABERDEEN UNIVERSITY PRESS

THE TEACHER'S
HANDBOOK OF PSYCHOLOGY

ON THE BASIS OF

"OUTLINES OF PSYCHOLOGY"

BY

JAMES SULLY, M.A., LL.D.

GROTE PROFESSOR OF MIND AND LOGIC IN UNIVERSITY COLLEGE, LONDON
LECTURER ON THE THEORY OF EDUCATION IN THE COLLEGE OF PRECEPTORS, LONDON

FOURTH EDITION, RE-WRITTEN AND ENLARGED

LONGMANS, GREEN, AND CO.
39 PATERNOSTER ROW, LONDON
AND BOMBAY
1897

PREFACE TO FOURTH EDITION.

The present edition has been carefully revised throughout, largely re-written and enlarged by about fifty pages. While seeking to preserve the original character of the book as an *introduction*, I have felt it necessary—in view of the fact that our best Training Colleges for Secondary Teachers are now making a serious study of psychology—to amplify somewhat and bring up to date the exposition of scientific principles. I have also touched on those recent developments of experimental psychology which have concerned themselves with the measurement of the simpler mental processes, and which promise to have important educational results by supplying accurate tests of children's abilities. The new branch of the science known as child-psychology has been more fully drawn upon, from the conviction that it is only when teachers have made a careful study of the spontaneous movements of children's minds during the first years that they are likely to find their way readily to the minds of older children, which preserve many more survivals of the earlier mental characteristics than most of us are wont to suppose. The practical applications have purposely been left in the form of *general prescriptions*,

which have to be filled in by the lecturer at the Training College with the concrete facts of the student's own experience. Beginners may, on a first perusal, omit the paragraphs in small type, as also some other portions which a competent teacher can easily point out.

I acknowledge with pleasure my indebtedness to the valuable suggestions kindly sent me by friends, more particularly Professor Lloyd Morgan (who was good enough to read through the old edition for the purpose), Miss Alice Woods, of the Maria Grey Training College, and Miss M. H. Wood.

HAMPSTEAD, *July*, 1897.

CONTENTS.

PART I.

MIND AND ITS DEVELOPMENT.

CHAPTER I.

PSYCHOLOGY AND EDUCATION.

CHAPTER II.

SCOPE AND METHOD OF PSYCHOLOGY.

CHAPTER III.

CONNECTION OF MIND WITH BODY.

Chapter IV.

FUNCTIONS OF MIND: KNOWING, FEELING, AND WILLING.

Chapter V.

MENTAL DEVELOPMENT.

Supplement to Chapter V.

PART II.

DEVELOPMENT OF INTELLECT.

CHAPTER VI.

PSYCHICAL ELEMENTS: SENSATIONS, ETC.

PAGE

CHAPTER VII.

MENTAL ELABORATION: ATTENTION.

Early Development of Attention.

Chapter VIII.

PERCEPTION THROUGH THE SENSES.

Chapter IX.

REPRODUCTIVE IMAGINATION.

CHAPTER X.

REPRODUCTIVE IMAGINATION—(CONTINUED) : MEMORY.

CHAPTER XI.

PRODUCTIVE IMAGINATION.

PART III.

THE DEVELOPMENT OF FEELING.

Chapter XVI.

GENERAL CHARACTERISTICS OF FEELING.

Chapter XVII.

EGOISTIC AND SOCIAL EMOTIONAL STATES.

Chapter XX.

DELIBERATE ACTION: MORAL CHARACTER.

Education of Will and Character.

Supplement to Chapter XX.

PART I.

MIND AND ITS DEVELOPMENT.

CHAPTER I.

PSYCHOLOGY AND EDUCATION.

Art and Science. The doing of a thing presupposes some knowledge: for every action is the employment of certain agencies which stand in the relation of *means* to our particular *end* or object of desire; and we could not select and make use of these means unless we knew beforehand that they were fitted to bring about the fulfilment of our desire. This is evident even in the case of simple actions. Thus if after sitting and reading I feel cold and set about warming myself by parlour gymnastics or by a brisk walk, I am clearly using the knowledge that such bodily exercise is fitted to restore warmth. And it is still more manifest in the case of complex actions. The doings of an engineer, of a surgeon, or of a statesman, involve a considerable quantity of knowledge of various kinds. All knowledge which is thus serviceable for doing things is known as Practical Knowledge.

This Practical Knowledge, again, may be divided into two sorts. Thus the knowledge implied in the above

example, that muscular exercise promotes bodily warmth, may be knowledge that I have gathered from my own experience aided by what others have told me; or it may have been obtained from a study of the bodily organism and its functions, and of the effects of muscular activity on the circulation, etc. The first kind of knowledge, being directly derived from my own or somebody else's experience or observation, is called experiential or *empirical;*[1] the second kind, being the outcome of that revision and extension of everyday experience which make up the work of science, is named *scientific.*

The chief differences between empirical and scientific knowledge are the following: (1) The former is based on a narrow range of observation, and on observation which is apt to be loose and inexact; the latter, on a wide survey of facts and on accurate processes of observation and experiment. (2) The former consists of propositions which have only a limited scope and are never, strictly speaking, universally true; the latter is made up of propositions of wide comprehensiveness, and of universal validity, known as principles or laws. (3) As a result of this the conclusions deduced from empirical knowledge are precarious, whereas the conclusions properly drawn from scientific principles are perfectly trustworthy.

We call any department of practice an Art when the processes involved are of sufficient complexity and difficulty to demand special knowledge and a preparatory

[1] The student should note that the expression "practical knowledge" as used in everyday life refers especially to this direct experiential acquaintance with a thing. But it is better to enlarge the expression as I have done in the text, making it signify *all knowledge which aids us in practice.*

study, and to offer scope for skill and excellence. Thus we talk now of an art of cooking, because with our advanced civilisation the preparation of food has become so elaborate a process as to call for special training and skill.

The arts of life must always have required a certain amount and variety of knowledge. In the early stages of development, however, they were carried on by help of the more defective empirical kind. Thus in agriculture men sowed certain crops rather than others in given soils, because they and those who preceded them had found from experience that these generally did better in these soils Similarly in medicine men resorted at first to a particular remedy in a particular disease, because their practical experience had taught them the utility of so doing.

Such guidance from empirical sources was in time found to be insufficient. Workers in the various arts asked for a deeper knowledge of the agencies they employed and the processes they carried out, and so they had recourse to science. Thus the art of agriculture has profited from the sciences of chemistry and botany, and the art of medicine from the sciences of anatomy and physiology. The union of scientific principles with art is seen in the current use of the expression, "the science and art" of agriculture, medicine and so forth.[1]

The reason of this is plain from what has been said above. The characteristic imperfections of empirical knowledge become more and more manifest as an art develops. These defects are very conspicuous in the case of the more complex arts, particularly those which have to do with living things. This is clearly illus-

[1] The expression "theory and practice" points to the same fact of the fertilisation of practical problems by scientific ideas.

trated in the case of medicine. The organic processes going on in the human body are so numerous and complicated, and vary so greatly in different persons, that we cannot easily put our experiences into a general form and say, for example, that a particular change of diet will always produce one uniform effect.

It is important to understand the precise function of these scientific principles in their bearing on practice. First of all, then, it is to be borne in mind that they do not take the place of empirical observations and generalisations. These are at first, as already remarked, the only knowledge by which an art can guide itself; and they always continue to form a valuable part of every theory of a practical subject. In other words, knowledge how to do things just because it is "practical" must be in touch with actual facts, and have something of an experimental character. Science merely supplements this experimental knowledge, filling up its gaps, making it more exact, and harmonising it into a system by means of its comprehensive principles or laws.[1] It lifts us to a higher point of view, and helps us to understand what we do, alike when we succeed and when we fail in what we aim at. It sometimes renders more direct practical help by enabling us to anticipate the slow and uncertain progress of empirical discovery. Thus, in the art of surgery, the modern method of treating wounds is largely the direct outcome of scientific

[1] A scientific law—to be carefully distinguished from a legislator's "law"—is a truth, respecting the happening or mode of production of things, made as comprehensive or universal as possible. The great principle of gravitation, as discovered by Newton, and the comprehensive modern biological principle of Natural Selection are examples of such laws.

reflection on the nature of lesions or "hurts," and on the natural process of healing.

ART AND SCIENCE OF EDUCATION. The above remarks may help us to understand the fact that the art of education is now seeking to ground itself on scientific truths or principles.

As an art, Education aims at the realisation of a particular end. This end must, of course, be assumed to be clearly defined before we can repair to science to ascertain what agencies we can best employ in order to compass it. It is the province of Ethics, the highest practical Science, which examines the nature of human good in general, to determine the end of education.

Although ethical writers are still at variance as to how we should define the chief good of man, and as a result of this writers on education have put forth different definitions of the end of education, we see an approximation to an agreement. What has been especially made clear in the recent definitions from those of Kant and Pestalozzi downwards is that *Education has to do with the development of power or faculty*, that *it aims at a full, harmonious realisation of the normal capacities of man.* Educators are practically agreed that their work is to act methodically by social and personal influence on the growing powers of the child, so as to bring to maturity in proper organic connection and balance all the tendencies and impulses of child-nature which have human value, and which enter into our ideal conception of a perfect man or woman.

From this broad definition of education we see at once that merely empirical knowledge will carry us but a little way in realising our end. For the human being

which it is our special business to develop is plainly the most complex of all living things. It is at once a material organism and a conscious mind or person, and each of these has to be considered by the educator. Not only so, the conscious or mental attributes, which are by far the most important, include a variety of powers, some of which we mark off as intellectual, others as moral. We find further that these several physical and mental powers, being all parts of a connected system or organism, interact one upon the other in a very intricate and puzzling manner. Closely connected with this peculiar complexity of the human being we have its great variability, which shows itself even in the child as the germ of what we call individuality. It follows from all this that mere observation and practical experiment could never have led men far on the right educational path.

It is matter of history that the older methods of educating the young were faulty, and in some respects radically wrong, just because they were not arrived at by aid of a profound and scientific study of the human mind and its laws. Thus, to take an obvious instance, the cardinal error of making so much of intellectual instruction dry and unpalatable arose out of ignorance of the elementary truth of human nature that intellectual activity is only fully awakened under the stimulus of feeling in the shape of interest. That this was the real source of the blunder is proved by the fact that the modern educational reformers, Locke, Pestalozzi, and the rest, grounded their plea for reform on a deeper study of children's minds.

Since education aims at developing human powers, and since it works on the rudiments of these as they show

themselves in the child, it is evident that the scientific guidance which the educator needs must be supplied by a clear and accurate knowledge of the characteristic traits and tendencies of child-nature. This will embrace the whole organism of the child, body and mind, its various susceptibilities, its ways of reacting on external agents and influences, and the manner in which it spontaneously tends to develop.

Divisions of Science of Education. These principles are derived in the main from two sciences, Physiology or the science which treats of the bodily organism, its several structures and functions, and Psychology or Mental Science which deals with what we call mind or consciousness, its several processes and the laws of these. The former principles, including certain applications of physiological science known as Hygiene, underlie what is now called Physical Education, the training of the bodily powers and the furtherance of health. The latter form the basis of education in its higher phases, *viz.*, the training and forming of the mind.

Mind-training, or education in its higher sense, again, falls into distinguishable branches. We commonly mark off Intellectual training, or the culture of intelligence, from Moral training, or the formation of will and character. These divisions, however, do not adequately represent the complexity of our mental activity. As we shall see presently, a child has not only an understanding to be enlightened and a will to be disciplined, but feelings, such as love and hatred, admiration and contempt, to be directed to suitable objects. This direction is the special work of Æsthetic education, the cultivation of the finer feelings which we call taste.

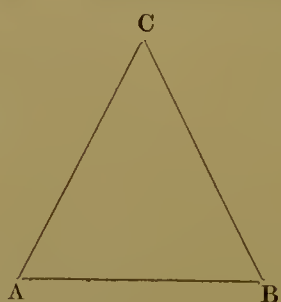
In giving this assistance to education psychology is supplemented by three sciences which are not purely theoretical like it, but have a regulative or "normative" character, their special province being to regulate the working of the mind in each of the three forms of activity here recognised. These are Logic, which regulates our intellectual processes by supplying us with standard forms of valid thinking; Æsthetics, which aims at giving us a standard of beauty and criteria by which we may judge of its existence in any instance; and Ethics, which fixes the ultimate standard of right and wrong action, and determines what are the several human duties and what constitutes a good or virtuous character.

It should be noted by the student that Ethics has a double relation to education. As the science of ends or human good *as a whole* it stands at the foundation of all education: as the regulative science which has specially to define our conceptions of moral good and virtuous character it stands in a special relation to *moral* training. The two relations merge into one if with Kant and Herbart we make the development of the good will the supreme end of *all* education.

The scientific groundwork of the art of education may perhaps be made clearer by the following diagram:—

(C) Educational end. Ethics (as the science of ends).

Educational processes.
(AC) Physical: *viz.*, Physiology, together with Hygiene.



Educational processes.
(BC) Mental: *viz.*, Psychology, together with Logic, Æsthetics, and Ethics (as the science of duty and of virtuous character).

RELATION OF PSYCHOLOGY TO EDUCATION. Among the several sciences which have to do with the processes of Education psychology occupies the chief place. As

Herbart has it, psychology is *the primary auxiliary science of the teacher.* Although all education, even that of the schoolroom, has to do to some extent with the bodily health and development of the child, it has to do so mainly in its connection with the exercise and strengthening of the mind. Psychology has further a more immediate and far-reaching bearing on the child's mental development than the ancillary regulative sciences, logic, etc.

It must be evident, indeed, that if the business of the educator is mainly the training of the mind to certain good practices in thinking and acting, his greatest need is a knowledge of the ways in which the mind works, and of the action of external forces in exciting, as well as in altering the directions of, mental activity. If, for example, a teacher wants to know how to get a child to take an interest in some branch of knowledge, or how to set about correcting a bad habit in a pupil, he will do well to acquaint himself with the essential *conditions* of the growth of interest in general, or of the modification of habit in general.[1]

As we shall see more fully presently, a child's mind develops, and can only develop, by carrying out again and again in a progressive order of difficulty certain functional activities. By a function or functional activity is meant the mode of activity proper to an organ. Thus it is the function of a muscle to contract, of a nerve to trans-

[1] The student must pay special heed to the ambiguous word "condition". As used above in its scientific sense, it points to the forces and circumstances on which any product depends, and which together make up its cause. Thus fresh air, good diet, normal exercise, etc., are *conditions* of health.

mit impulse. Just as our muscular organs grow strong and supple by appropriate exercises so do our mental organs. Viewed from this scientific point of view, *all education proceeds by calling forth normal functional activity.* Thus if a teacher wants to "impart" knowledge, as we say, it is not enough for him to set forth his own knowledge in words—he must excite in the child's mind certain activities by which the knowledge is created anew. In other words, education acts by applying "stimuli" to a living organism and calling forth appropriate "reactions".[1] This new conception of education makes still clearer its close dependence on psychology. We can only work successfully and advantageously upon the child's mental organism when we understand the modes of reaction proper to it, and the relation between certain varieties of stimuli and certain varieties of reaction.

It is sometimes supposed that only certain parts of psychology, *viz.*, those dealing with the processes of acquiring and reproducing knowledge, need be studied by the teacher. But this is an error. Even if one were to allow that the educator is to busy himself only with instruction, one might still contend that he needs to know something of the child's mind as a whole. As we shall see, there can be no adequate training in the acquisition of knowledge through words which does not embrace a training of the observation and of the imagination also ; nay more, which does not go outside the field of intellec-

[1] A stimulus is an external agent applied to a sensitive organ. Thus light is the stimulus of the eye. A reaction is the resulting action of the organism itself, as when the eye closes upon the sudden approach of an object.

tual activity and call in the aid of the feelings under the form of a pleasurable interest, and of the will in the form of a desire and an effort to learn.

It follows, then, that the teacher needs some general acquaintance with the principles of psychology, even though he is aiming merely at the most rapid and effective method of "storing" the mind with knowledge. But it may be assumed that few teachers now limit their efforts to this object. Education, in its true sense, the development of power or faculty, is aimed at by the intelligent teacher in the process of instruction itself, which thus becomes in a measure at least a means to an end beyond itself. And some attention is paid as time allows and opportunity suggests to the cultivation of the feelings and the formation of good moral dispositions and habits. This being so, a view of the mind as a whole, and a clear apprehension of the way in which its several activities interact one on another, may be said to be of real service to the teacher.

It follows from what was said above concerning the relation of science to art that there are two principal uses of psychology to the teacher. (1) An accurate acquaintance with the functional activities of the child's mind, which it is his duty to strengthen, develop and regulate, will supply him with a criterion or touchstone by which he may test the soundness of existing rules and practices in education. (2) This knowledge may be made to suggest larger views of educational work, better methods of training, to direct new educational experiments, on the judicious carrying out of which the further development of the art so largely depends.

No doubt we may expect too much from a study of

mental science. For one thing, a young teacher who hears so much in these days about the value of psychology may easily be led to think that this science is able to point out to him the goal of education as well as the way to it. But as Herbart pungently puts it in his *Letters on the Application of Psychology to Pedagogy,* psychology will just as readily help the bad educator to attain his aim as the good one. We must think out our educational end in the light of the principles of Ethics before we can ask help of psychology.

A more important point, perhaps, is that even with respect to the carrying out of the processes of mental training psychology in itself is not sufficient. As we have seen, an art is constituted by the organic union and interpenetration of scientific principles and direct practical experience of the details of the work to be done. A teacher is called upon to deal with certain children, A, B, C, etc., each of whom has his own individual group of traits, and bears in his manners, language, etc., the impress of a peculiar set of home influences. It is evident that the account of the general properties of a typical mind, which is all that psychology gives, will not be a sufficient equipment for his task. He must add special knowledge of the mental characteristics of the race and class with which he has to deal, and must make a separate study of each of his individual pupils and of their circumstances. In connection with this more concrete and practical view of his work, he will do well to get as much guidance as he can from other educators' experience. If, as Professor Jos. Payne tells us, mere empiricism makes the mechanical artisan, not the artist, it is no less true that mere theorising

without actual touch with the concrete practical problems and the "instinctive" insight into ways and means which is developed by this makes the vague, incompetent dreamer.

Our best systems of training now recognise the truth that scientific principles must be clothed with practical particulars before they are available for the teacher. The lecturer on psychology at the training college must aid in this by adding numerous and varied illustrations. The students must bring their own concrete experiences to bear on their text-book as they read it. Conversely they must begin to apply the principles when learned both in preparing their own lessons and in criticising those of others. I will venture to add that they should be encouraged, if not required, to make a careful methodical observation of at least one individual child with the help of the general knowledge of a child's mind which psychology supplies. In this way *scientific and empirical knowledge will supplement and aid one another*, and be organised into a special artistic faculty, that of the enlightened teacher, ready to understand and to deal with all new cases of child-nature as they may arise.

REFERENCES FOR READING.

On the relation of Psychology to Education the student may consult: Jos. Payne, *Lectures on the Science and Art of Education*, lect. i. and ii.; Herbert Spencer, *Education* (cheap edition), chap. i., p. 24 ff.; A. Bain, *Education as a Science*, chap. i.; W. H. Payne, *Contributions to the Science of Education*, chap. ii.; S. S. Laurie, *Institutes of Education*, parts i. and ii.; *Introduction to Herbart's Science of Education*, by Mr. and Mrs. Felkin, introduction and chap. i.; and J. Sully, "The Service of Psychology to Education," in the American *Educational Review*, vol. iv., 1892, p. 313 ff.

In French literature the subject has recently been dealt with by G. Compayré, *Cours de Pédagogie*, 1ère leçon ; H. Marion, *Leçons de Psychologie*, 1ère leçon.

The reader of German may further consult: Waitz, *Allgemein: Pädagogik*, "Einleitung," § 1: Beneke, *Erziehungs und Unterrichtslehre*, §§ 4 and 5, and T. Ziller, *Allgemein: Pädagogik*, "Einleitung".

CHAPTER II.

SCOPE AND METHOD OF PSYCHOLOGY.

DEFINITION OF PSYCHOLOGY. The term Psychology (from ψυχή, soul, and λόγος, reasoned account) may be defined as the science which aims at an exact and systematic account of the several processes or functional activities of our minds. A few words of explanation may make this definition clearer.

First of all, then, it is to be noted that the subject-matter of psychology is distinct from that of the physical sciences and peculiar to itself. It consists of the feelings, thoughts, and other processes of the inner sphere of our mental life. Psychology seeks to describe and explain what are called *psychical* states or processes.[1] It thus stands in marked contrast to the physical sciences, such as chemistry and physiology, which have to do with *physical* events in the outer material world that we can observe by means of our senses. As we shall see presently, we cannot investigate the processes of thought and feeling by help of the senses,

[1] The term "process" as involving a progressive change taking place in time is now commonly substituted for the older term "state". As we shall see, all our mental experiences, *e.g.*, our thoughts and our emotions, are not fixed states but rather mental *movements* or gradual changes.

but only through the exercise of a particular power, which Locke called an "inner sense".

It is important to note that the terms "mind," "mental," when used by the psychologist, are used for all varieties of our conscious experience. In popular language they refer more particularly to the intellectual processes. A man is said to exercise his mind when he remembers or reasons. For the psychologist, however, a sensation of taste, and a feeling of pain or of pleasure, are mental or psychical facts.

In the second place, psychology in its scientific study of mental processes confines its view to observable appearances or "phenomena" (from Greek *φαίνομαι*, I appear). Any conscious process, *e.g.*, thinking, is described by referring it to a subject or person, as when we say "I think," "He thinks". But psychology does not tell us the meaning of this "I," this "ego" as the philosophers say. It merely investigates the process of thought as this can be observed. In other words, in taking the fact "I think," "I feel pain," and so forth, it examines what is meant by thinking, by feeling pain, but leaves the "I" or subject alone.

Mental and Bodily Processes. While it is necessary to set psychical phenomena in sharp contrast to physical, we must keep in view the close connection that exists between the two. What we call a human being is made up of a bodily organism and a mind. When we speak of ourselves or others we always include this double fact. John Smith is a material object, that is, a human figure, that we can see and touch, to which we refer a conscious self having its peculiar individual character. We cannot speak of a human action without implying this same connection of the physical and the psychical. Thus if I say a person is talking, I refer to the physical move-

ments of his organ of speech and to a purpose or volition in his mind calling forth these movements. As we shall see presently, there is reason to suppose that all varieties of psychical processes are connected with functional actions of the nervous system.

How We Observe and Study Mental Processes. There are two distinct ways of investigating the phenomena of mind. In the first place, I may reflect on my own mental processes at the time of their occurrence or immediately after their occurrence. In this way, for example, I can note a succession of thoughts, or a colouring or biasing of the thoughts by a feeling of anger. This way of approaching mental processes is known as the direct or internal mode of observation, or as Introspection (from *intro*, inwards, and *spicere* or *specere*, to look). As pointed out above, Locke spoke of this power of introspection as a kind of inner sense. I can examine my thoughts and feelings, to some extent at least, as I can examine physical objects with the eye. We say indeed that we can fix our "mental eye" on a thought passing in our mind.

In the second place, I may study a mental process in another mind so far as this clearly betrays itself in outward manifestation. Thus in listening to a person's talk I can note the connections which his mind forms between certain ideas, in watching his actions I am able to study the play of his motives. This is called the indirect or external way of investigating mind, because we are here getting at mental facts indirectly through the medium of certain external manifestations perceived by the senses, as the audible word or cry, the visible movement or change of colour.

This indirect observation of minds is practically unlimited in its range. I can investigate the thoughts and feelings and actions not only of my friends and personal acquaintances but of those of whose doings I hear or read. In this way I am able to compare many samples of mind varying considerably in their modes of thinking, and so forth.

This extended view of mind in its individual variations leads on to what is now known as Comparative Psychology, *viz.*, the study of other forms of conscious life than that of the civilised human adult, *viz.*, in members of uncivilised races, in children, and in the several grades of animals. Here it is evident we are trying to get at simpler phases of conscious life than we can study in our own mature minds.

From what was said above about the exactness of scientific knowledge we may easily see that neither the direct nor the indirect mode of investigating psychical processes is complete without the other. To begin with, since we can only directly observe what is passing in our own individual mind, some amount of introspection is the first condition of all certain and accurate knowledge of mental states. To try to discover what these are like merely by watching the external manifestations in others would be futile. The gesture, the movement, the cry, even the word, on account of which we attribute a thought or feeling to another person, is in itself as empty of meaning as a mathematical formula to one who knows nothing of the symbols of the science. They only take on their meaning by a kind of projection into them of a reflection of our own thoughts and feelings. When I hear a cry of pain or a shout of pleasure I instantly

endow the crier or the shouter with a feeling like my own when I cry or shout. *Certain knowledge of mental states must thus begin at home.* Those who have the clearest knowledge of how they felt when children will be the best observers of other children.

On the other hand, an exclusive attention to the contents, movements or changing states of our individual mind would never give us a *general* knowledge of the mental functions. In order to generalise our knowledge, to make it as comprehensive and universal as we can, we must widen the field of observation and compare our own modes of thinking and feeling with those of others. Moreover, as we shall see later, the indirect study of simpler phases of mind, more particularly in the child, is of the greatest importance for disentangling and explaining these complex processes which we find in our own maturer minds.

It may be well to point out that each of these ways of studying mind has its characteristic difficulties. To attend closely to the events of our mental life presupposes a certain power of "abstraction". It requires at first a considerable effort to call off our thoughts from the interesting sights and sounds of the external world, and to fix them on the impalpable, invisible events of the inner spiritual world. Even if we succeed in focussing our attention on the mental sphere we are met by such a confusing tangle of processes that it is only by patient effort and prolonged practice in introspection that we shall succeed in understanding what is presented to observation, and find our way to the elementary functions from the play of which all the variety of our mental life arises.

On the other hand, in trying to penetrate into the conscious experiences of others, there is a danger of projecting into them our own particular habits and tendencies. This danger increases with the degree of remoteness of the type of mind which we are observing from our own. Thus we are very liable to read too much of our own ways of thinking into children's language, and to suppose that their actions are prompted by motives similar to our own. In historical studies, again, the modern mind is apt to interpret the human actions of the past by the standard of modern ideas and aims, not allowing for differences in the world-age, in racial temperament and in national sentiment. A careful investigation of others' mental experiences implies close attention to the differences as well as the similarities between the external manifestations of mind in different persons, ages and races, also *an effort of imagination* by which, though starting from some remembered experiences of our own, we feel our way into a new set of circumstances and a new group of mental tendencies.

Observation of Children's Minds. These difficulties are strikingly illustrated in the attempt to note and interpret the outer manifestations of children's minds. This observation is of the greatest consequence to psychologists in general, for a sound knowledge of the early forms of the mental processes is a necessary preliminary to a scientific explanation of their later developments. And to the educator this knowledge of the immature and unformed mind constitutes the most important department of psychology. Yet this is perhaps one of the most difficult branches of psychological inquiry.

The reason of this can easily be seen. Children have

their own characteristic ways of feeling, of regarding things, of judging as to truth, and so forth. And although the adult observer of children has himself been a child, he is rarely able to recall his own childish experiences with distinctness and completeness. How many of us are really able to recollect the wonderings, the terrors, the grotesque fancies of our first years? Again, children are not infrequently held back from fully expressing themselves by shyness, by the fear of exciting ridicule, and so forth. As another obstacle to our clear understanding of the movements of children's minds, I may refer to their imperfect mastery of that medium of speech by which they have to make known their ideas and their wishes.

Nevertheless, these difficulties are not insuperable. They can be got over where there are present the qualifications of a good observer, and an earnest purpose. And it must be borne in mind that if there are special difficulties in the case there are also special facilities For children as compared with adults are frank in the manifestation of their feelings, and free from the many little artifices by which their elders are wont, only half consciously perhaps, to disguise and transform their real thoughts and sentiments in expressing them to others.

The special qualities needed for a close observation and deep understanding of the child-mind are, first of all, a trained faculty of psychological observation, and, secondly, a keen loving interest in children. Both of these are necessary. A person may be practised in psychological observation, but if he does not care for children, and cannot recall his own childish feelings, he will fail to see far into child-nature and child-life; and

this because he cannot place himself in imagination in the circumstances of children, so as to realise how they are affected by things. A warm, tender interest leading to a habit of unfettered companionship seems to be a condition of a fine imaginative insight into children's minds, and of a firm grasp of the fact that their ways differ in so many respects from our ways. On the other hand, if there is the kindly feeling without the trained faculty of observation, there is the risk of idealising childhood and investing it with a charm and a grace in excess of what really belong to it.

In the matter of child-observation the psychologist may look to the educators of the young, the parent and the teacher, for valuable aid. Some of the best observations on the first movements of the infant mind which we already possess have been contributed by fathers. And much may still be done by parents in the way of recording the course of development of individual children. I think, however, that teachers should supplement the work of parents here. Private governesses of young children have an excellent opportunity of noting and recording the spontaneous processes of childish thought and impulse, and I have pointed out above that teacher students in our training colleges might well be exercised in a methodical observation and registration of the processes and the progressive development of the child's mind. Even the school might be used much more extensively than it has been for collecting observations of children, and laying the foundations of *Statistics* of Childhood. This would serve to show, for example, how in general memory strengthens with years and the disciplinary exercises of school-life, in what order and at

what ages particular feelings and interests get fixed and deepened, and so forth.

Experiment in Psychology. One of the most important recent changes in the observation of mental processes has been effected by the introduction of experiment. In an experiment as distinguished from a merely passive observation we ourselves bring about a phenomenon which we want to study by arranging circumstances and setting forces in operation. Thus it is an experiment when a chemist puts certain carefully measured quantities of material into a retort, applies heat to the mixture, and investigates the result of the process.[1] A good deal of this experimental investigation has been carried out in the region of the senses. Thus light of different quantities has been applied to the eye of a person with the view of ascertaining how much of this light stimulus must act before he has a recognisable sensation at all, and how this quantity must be increased in order that he may be aware of an increase of sensation. As this illustration shows, the value of these new experiments in psychology is that they help to make our knowledge of mental processes more exact, that they enable us in certain cases to *measure* psychical phenomena and their variations. Thus by help of special physical apparatus which registers a very small fraction of a second it has become possible to measure the exact interval between hearing a signal and responding by a manual movement to this signal as soon as it is heard. This interval, known as "reaction time," that is, the time of reacting by muscular movement to a sensory stimulus, varies in different persons, being longer in the case of some, shorter in that of others.

It may be added that this new feature of experiment and of experimental measurement has penetrated the region of child-psychology. A beginning at least has been made in the methodical measurement of such points as the following: the acuteness of the senses of sight, hearing, etc., in children; the time required for such simple mental actions as discriminating two colours; the number of times a series of syllabic or other sounds must be repeated in a child's hearing before he can accurately reproduce the series, and so forth. This new line of experiment, which will be illustrated more in detail later on, promises much for the development of a more exact psychology of the child's mind, both in its common features and in its individual variations.

[1] For the difference between passive observation and experiment the student may consult Jevons' *Elementary Lessons in Logic*, xxvii.

General Knowledge of Mind. As has been observed, science consists of generalised knowledge, that is, of knowledge expressed in the general form. Psychology after collecting observations of mental facts or phenomena proceeds to generalise by arranging or classifying these facts. In this way it reaches the conception of a class or group of facts, *e.g.*, "an emotion". In so doing it overlooks the differences between fear, anger, and other varieties, and fixes its attention on their common features or characters. A good scientific classification of the several varieties of psychical phenomena is a matter of great practical importance, whether we are dealing with mind in the earlier or in the later stages of development. Thus the teacher will be in a far better position to understand and to act beneficially upon a child's mind when he is able, through the possession of good general conceptions, to reduce in his thought its intricate tangle of processes to order and simplicity.

The last and most important stage of the generalising process of scientific investigation is Induction or the discovery of *laws*. Such Induction is in the physical sciences mostly concerned with what is known as causal dependence. Thus the chemist seeks to discover the *conditions* on which the fusion or separation of elements depends, the physiologist the conditions of diet, etc., which favour health and disease.[1] Psychology is also concerned with this problem of causal dependence. Thus

[1] Induction, which will be explained more fully-by-and by, means reasoning from observations of particular facts to some principle which they illustrate. On the meaning of the terms *law* and *condition* as used in science see above (pp. 4 and 9).

it asks what are the conditions of retention or memory, what are the circumstances which produce and favour the conservation of clear mental impressions. This knowledge of the laws on which the production of psychical facts depends is, moreover, of great practical value. For it is only by understanding what are the essential conditions in the formation of mental products (for example, good and bad habits) that we can help in forming them, or if necessary interfere so as to modify the process of formation.

Now a little examination will show that mental products are related in the way of dependence not only to processes immediately preceding their appearance, but to more remote antecedent activities. For example, every time your child responds promptly to your command his action presupposes, not only certain present conditions, *e.g.*, hearing the order given, but certain past conditions, *viz.*, the prolonged series of changes which we call the growth of a habit of obedience. It will presently be seen that some of the most important psychological laws have to do with this conditioning or determining of the present by the past. All that we mean by Laws of Development illustrates this point.

While psychology as science deals with the general type of mind, and the processes of development so far as they go on alike in all minds, it has to allow for differences among minds. The variations of mental capacity and disposition among children will be touched on throughout this work, and at the close an attempt will be made to probe these differences more deeply, and to show their bearings on education.

Before we go on to examine the psychical processes

in detail we shall do well to look at them from the physiological side, that is to say, in their connection with certain functions of the bodily organism. This aspect of our subject will occupy us in the next chapter.

REFERENCES FOR READING.

Students who desire a fuller account of the scope of Psychology and its mode of investigation may consult the following: Sully, *Outlines of Psychology*, chap. i., or the advanced work, *The Human Mind*, chaps. i. and ii. (both published by Longmans); Höffding, *Outlines of Psychology* (translated by Miss M. E. Lowndes, Macmillan & Co.), chap. i.; E. B. Titchener, *An Outline of Psychology* (Macmillan & Co.), chap. i.; and G. F. Stout, *Analytical Psychology* (Sonnenschein), vol. i., introduction.

On the special subject of child-observation, its methods and its difficulties, the following may be consulted: Sully, *Studies of Childhood*, i.; Compayré, *The Intellectual and Moral Development of the Child*, American translation (D. Appleton & Co.), introduction. The reader of German may also consult Rein's *Encyclopädisches Handbuch der Pädagogik*, article "Beobachtung (Pädagogische)".

CHAPTER III.

CONNECTION OF MIND WITH BODY.

THE BODILY AND THE MENTAL LIFE. We are all familiar in a general way with the close connection between mental and bodily processes. We know, for example, that changes in our bodily state, due to fatigue or ill-health, lower our mental energies, that mental activity in the shape of excessive strain of thought or anxiety reacts on the bodily organs. The researches of modern physiology enable us to understand better the way in which this interaction of body and mind is brought about. This it has done by showing us that our mental processes stand in a peculiarly close connection with the functional activities of a definite group of organs known as the Nervous System.

THE NERVOUS SYSTEM. The Nervous System, which thus subserves in a very direct and special manner the carrying out of our psychical processes, is a particularly delicate and intricately arranged set of structures, of which only the baldest sketch can be attempted here.[1] Though a continuous chain of structures it is easily seen to be made up of two unlike portions: compact

[1] The student is strongly recommended to obtain if possible some acquaintance with the elements of human physiology by help of practical demonstrations.

masses known as nerve-centres lying protected within the bony covering of the skull and backbone; and extensive thread-like ramifications known as nerves connecting these central masses with "peripheral" or outlying regions of the body, as the skin and the muscles of the trunk and limbs.

The nerves, which are bundles of exceedingly fine white fibres or threadlets, are the carrying portion of the nervous apparatus. These fibres are of two classes. The first connect the centres with various parts of the surface of the body, also with the internal organs, *e.g.*, the stomach. The more important of them are connected with organs of special sense, such as the skin, the retina of the eye, which are susceptible of being acted on by particular external agents or "stimuli," such as mechanical pressure, light, etc. Their function is to transmit the state of nervous activity produced by this stimulation from the periphery to the centre. Hence they are known as afferent (*i.e.*, incarrying) or centripetal nerve-fibres. Since the mental effect of this transmission of activity to the brain is what we call a sensation, these nerve-fibres are also called sensory, and the peripheral surfaces sensitive surfaces. Such are the skin, the retina of the eye, etc. The other class of nerve-fibres connect the centres with muscles, *i.e.*, the bundles of fibre by the contractions of which movements of the limbs, the organ of speech, etc., are produced. They carry nervous impulses from within outwards, and are known as efferent (*i.e.*, outcarrying) or centrifugal nerves. And since this outgoing activity immediately precedes and produces muscular contraction, and so movement, they are also called motor nerve-fibres. A

nerve may consist wholly of sensory or of motor nerves, or, as frequently happens, may contain both kinds of fibre.

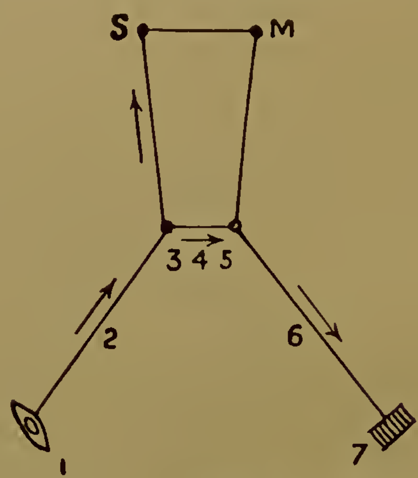
The nerve centres consist first of all of gray masses having a minute cellular structure. Portions of this gray substance standing in immediate connection with the sensory nerve-fibres are commonly spoken of as sensory centres, while other portions connected with motor fibres are known as motor centres. The several regions of the gray matter both in the spinal cord and in the brain are also connected one with another by bundles of nerve-fibres.

The central gray substance has for its peculiar function to transform sensory stimulation into movement, and to bring about connections or attachments between particular varieties and groupings of sensory stimulation and suitable motor responses. Thus it is through the agency of these nerve-centres that a prick on the hand instantly calls forth the movement of withdrawing the hand, or that on seeing a child about to fall we stretch out the arm and lean forward in order to keep it from falling.

These nerve-centres are arranged in a series or scale of growing complexity. The lower centres are those residing in the backbone, and known as the Spinal Cord. The higher centres lodged within the skull are called the Brain. Of these, again, the highest, which appear to stand in immediate connection with the more important part of our mental life, are known as the " cortex " or envelope of the " cerebrum " or big brain. The lower central masses are connected by fibres with the higher, and at each level in this scale of centres

there are fibrous threads uniting one portion of the gray substance with other and collateral portions. Of special importance are the "associative fibres," which connect one portion of the cortical centres with other portions.

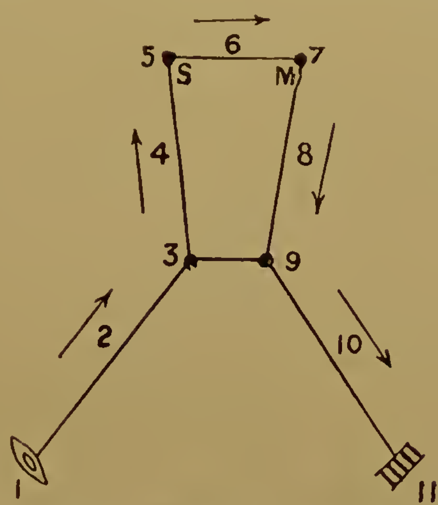
From this slight account of the nervous system it will be seen that the general form of its action is a sequence of two processes, *viz.*, one of sensory stimulation followed by one of motor excitation. This may be represented by the following diagram:—



Representing, in the path indicated by the numerals, 1 to 7, the shorter nerve-circuit, which does not involve the brain centres (S M), as illustrated in what are called "spinal reflexes". (1) Peripheral sensitive point; (2) Afferent nerve-fibre; (3) Spinal sensory cell; (4) Commissural (connective) fibre; (5) Spinal motor cell; (6) Efferent nerve-fibre; (7) Muscle.

This scheme roughly answers to the simpler type of actions of ourselves as well as of the lower animals, the type known as reflex action, *i.e.*, unconsidered movement in immediate response to external stimulus. Thus when a child asleep instantly withdraws his foot when this is pressed, the action is effected by means of the lower spinal centres. Such reflex actions, however, are attended with very little if any consciousness.

The considered and complicated actions involve the co-operation of the higher centres of the brain as well. In this case we have to suppose that the sensory stimulation instead of passing over at once into motor impulse is propagated further, and engages a larger area of the central structures. This may be symbolised thus :—



Representing the longer nerve-circuit through the brain centres which is involved in voluntary action. (1) Peripheral sensitive point ; (2) Afferent nerve-fibre ; (3) Spinal sensory cell ; (4) Afferent tract ; (5) Cortical sensory cell ; (6) Commissural fibre ; (7) Cortical motor cell ; (8) Efferent tract ; (9) Spinal motor cell ; (10) Efferent nerve-fibre ; (11) Muscle.

Such complicated actions are accompanied by a clear mental process ; we are conscious when we carry them out. They may be illustrated by the act of relieving the pressure of a tight boot by stooping and taking it off. This action involves a distinct sensation of pressure and a process of volition in resolving to get rid of the discomfort.

The Special Organs of Mind. We see from this that mental life is connected in a peculiar manner with the action of the higher centres which together make up the brain. More particularly, fully conscious processes,

such as observing and thinking, into which attention enters, seem to be connected with the highest centres of the brain (those of the cortex), which may be spoken of as *the psychical centres.* Only when the brain is called to take part is there any distinct mental accompaniment of the chain of nervous events. The brain thus stands in relation to the lower centres somewhat as the head of an office stands in relation to his subordinates. These last carry out the mechanical routine of the office; he interferes only when some new and unusual piece of work has to be done, and reflection and decision are needed. Moreover, just as the principal of an office is able to hand over work to his subordinates when it ceases to be unusual and becomes methodised and reduced to rule, so we shall find that the highest centres of the brain are able to withdraw from the nervous process when the actions have grown thoroughly familiar. This is illustrated in such actions as walking and writing, which we perform with little consciousness of the several movements of the legs, arms and fingers, because they have become easy and mechanical by repetition and habit.

According to the account here given, the brain may be described as a central office to which messages are transmitted from the external world, and from which suitable orders or responses are sent forth to the executive organs or muscles. The order need not be sent out immediately on receiving the message, as in the illustration given. Just as the chief of an office has to take time in thinking out his responsive order, say to a letter, so the brain. Although we can and often do act at once in response to a report of the senses, we often go through a long process of reflection and reasoning before we act.

And we may spend months and years acquiring knowledge for future action. All intellectual study, from that of the Kindergarten to that of the University, means the elaboration of the reports of the senses into methodical knowledge, which may not be needed for present action but is a necessary preparation for the wise, far-seeing action of later life.

How the Brain Does its Work. This is not the place to go into the obscure and difficult subject of the nature of nervous action. One or two facts of practical bearing may, however, be alluded to.

The process of storing energy takes place through the nutrition of the brain-substance. As the result of such nutrition there are built up certain organic compounds of great complexity and very unstable, *i.e.*, easily broken down again. When the central organs are active the stored energy is said to be liberated; and this liberation of energy means that the cells or cell-groups of the brain are disintegrated or broken down, and so need to be reconstituted by the processes of nutrition.

The mechanism by which this making and unmaking of the cellular substance of the brain is carried out is the capillary circulation. The blood has to bring the nutritive materials for the processes of repair; more than this, it has to bring the oxygen which is required for the functional activity of the cells when they undergo disintegration, and lastly to carry off the waste products of this disintegration. The brain may be likened to an engine which can only do its work when fuel is supplied and refuse is removed.

We see from this that the central nervous substance is being ever unmade and remade, or disintegrated and

redintegrated; and further, that there is a necessary relation between these two processes of decomposition and recomposition. No action of the brain is possible save so far as the processes of nutrition are carried out. For continued brain action there must be a rhythmic adjustment of the alternating process of giving out and taking in, somewhat similar to what takes place in the rhythmic process of breathing.

THE GROWTH AND DEVELOPMENT OF THE BRAIN. Of very special importance to the educator is the understanding of the way in which the brain grows. On this growth clearly depends improvement of mental power and advance in education.

As is well known, the brain is large and heavy at birth (in the case of the male about 372 grammes).[1] This weight increases rapidly during the first year (reaching over 900 grammes), and continues to increase, though at a less rapid rate, till about the end of the seventh year, by which time it has almost attained its full weight.

Along with this process of growth of the brain there goes on the development or the finer moulding of its structure. During the first months the brain-structure is very defective. The nerve-fibres are without their sheath: the nerve-cells are undeveloped; the fibrous connections between the highest centres in the cortex and the lower centres, as well as the clear marking out of and connections between the several "convolutions" or folds, are very far from being completed. The *growth* of the brain appears to depend on the expansion of the nerve-cells and the growth and multiplication of the fibres. Its

[1] A gramme is rather less than $15\frac{1}{2}$ grains.

finer *development* consists in the structural perfecting of these elements, as also in the clearer separating out or "differentiation" of the several parts or organs and the connecting of these by associative fibres into systems. This last may be called integration.[1] In this way the highest centres of the brain (in the cortex) are unfolded and brought into co-operative action with other parts of the nervous system. These processes of structural development go on till maturity is reached.

The order of development of the nerve-centres is of importance to the educator. How pertinent, for example, to the wise control of children's movements is a knowledge of the fact that the centres regulating the movements of the nearer joints, as the shoulders, are developed before those regulating the further joints, as those of the wrist and of the fingers. Again, there is reason to think that the highest centres of the brain (frontal lobes) which answer to the more difficult processes of thought are but very imperfectly formed during childhood.

Mental Activity and Brain Efficiency. As already pointed out, mental activity is directly connected with the exercise of brain-function. The greater the mental activity, the more the resources of the brain are taxed. We use more brain energy when we think "hard" or closely than when we only half think, and the more time we spend in such hard thinking the greater the consumption of the brain's store of energy. It follows from what was said above that every such

[1] Differentiation or "differencing" is the transition from similarity of parts (homogeneity) to dissimilarity of parts (heterogeneity). Integration is the connecting of such differenced parts into wholes or organic systems.

increase of functional exercise makes a heavier demand on the resources of the organism, requiring a more rapid circulation of the blood.

If the brain thus furnishes the physical support of mental activity, it is to be expected that this activity will vary in amount with the state of the organ. And this is what we find. We all know that if the nervous energy is lowered in any way, as by bodily fatigue, grief, etc., the brain refuses to work smoothly and easily. On the other hand, the action of stimulants, as alcohol, on the brain illustrates how the mental activity may for a time be artificially raised by adding to the excitability of the central organs.

The amount of disposable energy in the brain at any time, and the consequent readiness for work, will vary with a number of circumstances. These may be divided into (1) organic, or those which affect the organism as a whole, and (2) local, or those which affect the condition of the brain itself.

The Brain as Part of the Bodily Organism. (1) Since the brain and nervous system as a whole are parts of the bodily organism, which last is a closely connected system of organs powerfully interacting one on another, a considerable change in the condition of any one of these will tell on the efficiency of the brain. Thus a state of muscular fatigue coming after severe bodily exertion tends to lower the functional powers of the brain. More especially the state of the vital organs exerts a profound influence on the energies of the brain. When a special demand is made on the digestive organs, *e.g.*, after a good meal, leading to a diversion of blood as well as of nervous energy in the direction of these organs,

we are temporarily unfitted for severe brain exertion. Functional disturbances in these vital organs, such as a fit of indigestion or even an impeded circulation of the blood, leading to chilliness and sense of bodily depression, are known to be an obstacle to mental activity. Once more, all fluctuations in the condition of the organism as a whole, whether the periodic exaltation and depression of the physical powers which constitute the daily rhythmic life of the body, or those irregular changes which we call fluctuations of health, involve the brain as well. The "organs of mind," as they have been called, share with the whole body in the vigour and freshness of the morning, and the lassitude of the evening. It has been proved experimentally that the tide of nervous energy is fullest after sleep, then begins to run down till the middle of the afternoon, after which there is a slight rise again. Similarly the organs of mind share in the fluctuating well-being of the body. Lastly, it is all-important for the educator to remember that the brain passes through stages of growth and decay corresponding roughly at least with the progressive growth and decay of the body. Its powers in early life are thus necessarily limited by the imperfect state of development of the whole organism.

Brain-Work and Fatigue. (2) While the efficiency of the brain thus depends on the state of the bodily organs generally, it is affected by local changes in the condition of the organ itself. Thus after a period of rest, the cerebral substance being well nourished, there is a special readiness for work. It is this circumstance which explains the invigorating effects on the brain of sound sleep, as also of less complete forms of mental

repose, such as are found in the lighter forms of recreation. On the other hand, all brain-work tends to exhaust the nervous energy and so to lower the subsequent efficiency. If the work is light in character we have no sense of fatigue. We can often go on for two or three hours with intellectual work without being aware of any falling off in power. On the other hand, when the work is severe, as in grappling with some tough mathematical problem, we may, even after a short time, become distinctly aware of brain-fatigue, and of a temporary falling off in vigour. In the case of children, whose stock of brain-vigour is much smaller, these effects will, it is evident, show themselves much sooner. It has been proved by experiment that when children are doing class work there is a perceptible falling off in attention, *i.e.*, mental activity, after half an hour's application.

The physiological explanation of the phenomenon of brain-fatigue is as follows. In the lighter kinds of brain-activity the consumption of brain-material being small, the process of recuperation easily keeps pace with it: waste and repair compensate one another in a rhythmic balance. On the other hand, in the heavier sorts of mental work, energy is consumed faster than it can be supplied; the process of remaking (redintegration) does not keep pace with that of unmaking (disintegration).

BEARINGS ON EDUCATION.

Normal Exercise of Brain. The brain like other organs requires appropriate exercise. When the central organs are well developed and there is a good supply of nervous energy we see that children tend to seek mental

activity and to feel depressed and miserable when cut off from it. The tedium or ennui from which many lonely children are apt to suffer is an expression of this disposition of the brain to carry out its proper activity. The educator in introducing a certain amount of brain-stimulus is thus ministering to its health and its continued efficiency. Many children have grown brighter and happier after entering on school life, because this supplies a healthier regime for the activities of the brain and of the nervous system as a whole.

Not only so, education of some kind is necessary to the full development of the brain. Although the child's self-prompted activities and the influence of lively companions may do much to develop his brain-powers, such development is apt to be very imperfect. Physiologists tell us that only certain selected nerve-cells of the cortex of the brain reach a high degree of growth and structural development. The educator helps to determine which among the thousands of these microscopic germs of cells shall reach maturity.

Overtaxing the Brain. While a moderate and sufficient exercise is thus seen to be beneficial to the brain, it follows from what was said above that it is possible to exact from the nerve-centres more work than it is good for them to perform.

Such over-stimulation shows itself first of all in *brain-fatigue*, which, as we have seen, means that work has been carried beyond the point at which recuperation keeps pace with expenditure of energy. We are all apt to feel muddled or stupid, if not to suffer more distinct pain in the shape of headache, after a too severe mental strain.

A more prolonged excess of brain-work may induce other ill effects of over-stimulation. If we persist in studying when cold and hungry, and if, worse still, we form a habit of continuing at study to the neglect of the conditions of bodily health, we are apt to induce graver evils. *Nervous breakdown* is now known to occur as the result of too long and severe an application to mental work, more particularly under the artificial stimulus of our examination system. It is for the educator to bear in mind that these risks of over-stimulation are peculiarly great in the case of growing children. *During the periods of more rapid growth* especially, a large fund of nutritive material is needed for the processes. If too much is consumed by the brain, the progress of physical growth as a whole is liable to be obstructed. And when the organism suffers, the brain itself, which as we have seen is a portion of it, will in its turn suffer too.

In exercising a child's brain the educator should remember that the several functional activities making up the life of the organism are developed in a certain order. In the fœtal condition, and for some time after birth, the vegetable or nutritive functions are preponderant. The organism is chiefly concerned in building itself up. Then follow the animal functions of sense and movement, which begin to come into activity soon after birth, though they only attain considerable vigour much later. The highest or human functions, those constituting the intelligent life of man, reach their development later still. A boy of twelve or fifteen may have perfect senses and firmness and flexibility of muscle, but his brain-powers are vastly inferior to those of an adult.

This being so it seems to follow that all the higher mental training which makes severe demands on the brain-organs should be introduced very cautiously and only with a certain slowness and by means of wisely graduated steps.

Remission and Variation of Brain-Exercise. The great danger, especially with young children, is that of unduly prolonging the duration of the effort of mental concentration. A short exertion even of some severity may be harmless, whereas an unbroken application of mind, of like severity, for half an hour or more may be exceedingly harmful. One of the greatest improvements in modern educational methods, considered both from a hygienic point of view and from that of mental efficiency itself, is the substitution of short for long lessons, and the frequent *relaxation of mental strain* in favour of free bodily movement. These breaks, though in appearance occasioning a loss of time, and adding to the teacher's labours in restoring order and recalling the pupils' minds to the calm attitude of attention, are in reality a true economy of time and force.

Once more, the newer physiology tells us that the brain is a group of organs each of which has its own proper functional task to discharge. Thus there are centres which are specially concerned in receiving impressions of sight, of hearing and so forth. Similarly certain centres are especially engaged in bringing about particular movements, as those of the hands. It is probable that the higher intellectual processes, imagination and thought, specially employ certain parts of the cortex as their organs. This view of locally restricted brain-action suggests that nervous energy may be econo-

mised *by a due variation or alternation of activity* within the school itself. Thus by passing from an object lesson to a singing lesson the nervous centres of vision may be relieved from their strain, while other centres, the auditory and vocal, which have been resting, may be called into play. So a certain sense of relief may be secured by a transition from a subject which makes heavy demands on the centres specially engaged in thought, as mathematics, to an occupation which mainly engages the senses and the muscles, as the simpler kinds of drawing.

Differences of Brain-Power. The educator should bear in mind that the brains of children of the same age vary greatly in their size and functional capacity. The whole sum of vital force resident in the human organism is a different one in the case of different children, and the distribution of this among the several organs is also different. Hence, an amount of mental exercise that would be quite safe in one case would be harmful in another.

It is very important that a teacher should thoroughly acquaint himself by means of suitable tests with the differences of cerebral power among his pupils. Such tests may now be applied with something like exactness. Thus a child's power of attention both in a short and in a more prolonged effort, as in attending to a series of syllabic sounds, may, as will be shown later on, be measured with a fair degree of accuracy, and such measurement (allowing for the differences due to the improving effect of exercise itself) is a rough clue to differences of brain-energy.

In all such discrimination of individual brain-power

special care should be taken to recognise cases of *abnormal defect.* The study of the manifestations of nervous debility in early life by peculiarities of movement has already been taken in hand by medical experts, and when perfected it may be expected to contribute a most valuable addition to our knowledge of child-nature.

REFERENCES FOR READING.

A fuller understanding of the connection between mental activity and that of the brain may be obtained from one of the recent works on Physiological Psychology, *e.g.*, G. T. Ladd, *Outlines of Physiological Psychology* (Longmans), chaps. i. to ix., and xix.; and from such works as H. Maudsley, *The Physiology of Mind*, and A. Bain, *Mind and Body.* The Growth of the Brain is especially dealt with by H. H. Donaldson, *Growth of the Brain* ("Contemporary Scientific Series," Walter Scott).

The best work on mental fatigue in school children has been done in Germany. The reader of the language may be referred to Kraepelin, *Ueber geistige Arbeit*, Jena, 1894; Burgerstein, *Die Arbeitscurve einer Schulstunde*, Hamburg, 1891; and the article "Ermüdung," in Rein's *Encyclopæd.: Handbuch der Pädagogik.* The subject is dealt with more popularly in such works as Herbert Spencer, *Education*, chap. iv., and Sir J. Crichton Browne, Essay on "Education and the Nervous System," in *The Book of Health;* also in a number of recent works on Physical Education and School Hygiene.

CHAPTER IV.

FUNCTIONS OF MIND: KNOWING, FEELING, AND WILLING.

Analysis of Mind. Our study of mental processes must begin by an attempt to distinguish their more important varieties. This discrimination of one kind of process from another can only be carried out by means of an introspective examination of what takes place in our own minds. Since this examination proceeds by "taking apart" more complex processes in order to single out for special inspection their several constituent processes it is called *Analysis*, or more precisely *Introspective Analysis.*[1]

Now if we take an introspective glance at our mind at any time we find a rather confused state of affairs. Thus the reader may find himself mentally occupied with some news of a friend. The tidings bring about an excited condition of mind with a confused rush of ideas and feelings which it is very hard to distinguish one from another. And although some thoughts may stand out pretty distinctly, others are very faint and

[1] Analysis (from Greek ἀναλύω) means resolving a thing into its parts. In certain kinds of analysis, *e.g.*, chemical, a thing may have its parts actually separated one from another. In psychological analysis we do not make actual separation of the parts, but only *examine* them apart, that is, fix our attention selectively now on this now on that part of a mental process.

obscure. Not only so, the *total* mental state includes many elements not connected with the news, such as vague impressions of sight and hearing received at the moment, and still vaguer reports from the bodily organs telling of heat or chilliness, and so forth.

Yet, difficult as this analysis is, it is not impossible. If we take comparatively simple states of mind, if we confine our inspection to what is distinct and prominent, overlooking what is vague and hard to seize, and lastly if we compare one such state with others, we can soon disengage from the mixed and confused current of our mental life certain constituent processes which recur again and again in different combinations. Thus we find that though to perceive an object of sight is not the same thing as to perceive one of hearing, and though perception is different from imagining and from thinking, yet they all agree in being modes of *intellectual activity*.

Our everyday thought has indeed made us familiar with such distinctions. Our common ways of describing our mental life suggest that there are three main varieties of process. Thus when we observe, remember, or reason out something we are said to exercise our *intellectual* powers or faculties. When we are the subjects of pleasure or pain, of joy, grief, or anger, we are said to be *feeling*. When we are doing things consciously and with purpose we are said to be exercising our *will*.

TRIPLE FUNCTION OF MIND. The psychologist starts from these well-recognised distinctions. He attributes to mind a triple function,[1] that is, three characteristic funda-

[1] The term "function" is borrowed from biology, where, as we saw above, it is a name for the proper mode of activity of any organ, *e.g.*, movement, of the muscular organs.

mentally distinct modes of reaction, *viz.*, (1) the *affective function*, as manifested in feeling; (2) the *intellectual or cognitive function*, which issues in knowing; and (3) the *conative or striving function*, which issues in willing. (1) The first covers all our pleasurable and painful experiences, so far as we are considering merely their feeling-tone, *i.e.*, their pleasurable or painful aspect. Thus a painful bodily sensation, an emotion of love or of anger, with its marked feeling aspect or tone, clearly illustrates the affective function. (2) The intellectual function is exercised in the various processes of perceiving objects of sense, imagining things, and reasoning about them. (3) The conative function, or the *active* function, as it may be called in a peculiar sense, is illustrated in simple voluntary movements, as lifting the arm, as well as in difficult actions involving effort, as lifting a heavy weight, or resisting temptation; also in all intellectual activity in so far as this is directed to a purpose or end, as in serious study.

Functions and Faculties. The reader will observe that I have here used the word "function" and not "faculty". Popular psychology is apt to break up the mind into a number of distinct powers or faculties. Thus it marks off different "intellectual faculties," *e.g.*, observation, memory and reason, as though their operations were perfectly distinct processes having nothing in common. A more scientific view of mind rejects this idea. It is true that what we call an act of observation differs from one of memory or imagination, since in the first case we have an actual sense-impression of the object, whereas in the second we have only what is called a mental image. And there is a certain practical

importance in noting these distinctions; for, as we shall see, there is a meaning in saying that the educator has to form a faculty of observation, a faculty of memory, and so forth. Nevertheless it is a great error, even from the practical point of view, to overlook the fact that all intellectual processes, just because they are intellectual, are illustrations of one and the same kind of functional activity.

If now it is asked what is meant by an intellectual function, we must seek an answer by a more searching analysis of the process of knowing. We may take as an example my recognition of a friend in the street. Here the starting point is a visual impression or "presentation".[1] The intellectual function shows itself in mentally elaborating this presentation into the recognition of "my friend". Such elaboration consists essentially in a more or less distinct *apprehension of certain relations.* Thus in discerning my friend I am, first of all, aware, vaguely at least, of a *difference* between the appearance of this person and that of others. That is to say, I *differentiate* or *discriminate* the visual impression from other accompanying impressions, those of strangers.[2] Secondly, in *re*-cognising the person I must at least vaguely apprehend a *similarity* between what I now see and what I have seen before. That is to say, I *assimilate* the present complex sense-impression to others previously experienced; or, as some

[1] Presentation is that which is directly presented to us under the form of a sense-phenomenon, *e.g.*, a sight or a sound. It is, as we shall see, distinguished from a re-presentation or idea where the sense-phenomenon is no longer present, but is "recalled" by the mind.

[2] On the meaning of differentiation as applied to an organic structure, see above, p. 35.

would say, I *apperceive* the impression by help of the residua or leavings of previous like impressions. Lastly, in recognising him as *my friend*, I take up the new sense-impression into a more complex mental whole. That is to say, I mentally *place* the new experience in its proper surroundings, recalling *the connections of time and locality*, mentally realising that the person seen is So-and-so, who lives at such a place, etc., etc.

Now here we have the intellectual function resolved into three elementary ones.[1] All the cognitive work we do is resolvable into (*a*) differentiating material, (*b*) assimilating material and (*c*) associating or complicating material. The material may be given us directly by our senses, as in the above illustration; or it may be supplied by memory, under the form of mental images, or by the processes of verbal suggestion, as when another instructs us. But in all cases *we are intellectually active just so far as we carry out these elementary relationing or relation-seizing functions.*

This is intended only as a brief general analysis of the intellectual processes. We shall see later that though these three elementary functions co-operate in the closest way, one of them may sometimes be more prominent than others. The last two are each a mode of bringing together or attaching, assimilation or apperception being the connecting of like with like, association the linking together of concomitants. Hence they may for convenience' sake be brought together under the single head of *integration* or "wholing".

The word *apperception* (though the term is used in more than one sense) seems to be used by later German psychologists with reference especially to the process of assimilation. We apperceive a new

[1] The student must be careful to keep clear this analysis of intellectual activity into three elementary functions from the broad analysis of mind as a whole into the three functions, intellectual activity, feeling, and conation.

sense-impression or a new idea just as far as we can bring it into mental proximity to some similar or kindred idea already in our possession, which last may be said to illuminate it, and to help us to *class* it.[1]

Taking the view that the intellectual processes are made up of simple or primary functional activities, we may say that what is popularly known as a "faculty," *e.g.*, of memory or of reason, is something secondary, and a product of development. Thus a faculty of reason implies that a person has developed a specialised aptitude of a somewhat complex kind as the result of exercises of his intellectual functions in certain definite ways. From the point of view of the educator, a faculty should be thought of, *not as a starting-point, something given at the outset, but as a product of education itself.*

Just as a more searching analysis leads us to the discovery of the elements of the intellectual processes in certain simple functions, so it enables us to ascertain the most elementary forms of feeling and of conation. Thus we shall see that all the variety of affective states, joy, sorrow, fear, love, anger, are, so far as they are affective, made up of pleasure and pain. We shall find, too, that the simplest and most fundamental form of striving or active endeavour (conation) consists in *attention.*

Relation of Feeling, Knowing, and Willing. As radically dissimilar functional modes of working these three types of process have, of course, to be sharply distinguished one from the other. As is implied in what

[1] For an excellent detailed illustration of the process of apperception as thus understood, see K. Lange, *On Apperception*, part i. (American translation, Heath & Co.).

was said above, the three phases of mental activity are not equally prominent at all moments. In calm reflection we are more intellectual than anything else, whereas in the first smart of a disappointment we are more affective than anything else, and in making an exceptional muscular effort we seem to be all conation. If, indeed, we take any one of these aspects of mind in a fully developed and strongly marked form, we see that it is in a manner opposed to the other aspects. Thus a wave of passionate feeling excludes at the time calm thinking (recollecting, reasoning), as well as concentrated effort. Similarly the intellectual process of remembering or reasoning when most perfectly carried out leaves no place for the intenser degrees of feeling.

Yet while the three functions are thus not merely distinct, but appear to some extent to be antagonistic, they are in reality inseparably connected. A mind or mental organism is more of a unity even than the bodily organism with which it is so closely connected. As we have seen, our analysis of mind into functions is merely a distinction *in our thought* of this and that phase : it does not imply any actual separation. Our real mental processes are always compounded of these three factors. We cannot experience any pain without being *intellectually* active so far as to perceive the seat or the cause of the pain, or without being *conatively* active in striving to get rid of it. So again in our calmest intellectual moments we can always detect a faintly agreeable or disagreeable accompaniment, a sense of ease and success or of difficulty and perplexity, as well as an element of conation in attending to our ideas and trying to put them in order. Hence we may say *that although*

one of the three functions may at a given moment be more prominent than the others they always work together in producing our concrete mental states.

As we saw above when examining the workings of the nervous system, we are so organised as to respond actively by means of our muscular movements to the reports we receive from our environment through the channels of the senses (see p. 30 f.). So too we find, if we carefully analyse our mental processes, that they commonly disclose the same order of events. Thus in crossing a street I perceive a vehicle about to come athwart my path, and I either stop or hasten my steps; or I hear some interesting news about a friend and desire to act upon it in some way. Here, it is evident, we have an intellectual process leading up to some appropriate action. In both these cases it is to be noted that the intellectual process is accompanied by feeling. Thus the sight or sound of the vehicle causes an incipient fear; the news gives pleasure or excites hope.

Now this order is so common as to be typical. We may say, then, that *our concrete mental processes take the form of sense-presentations* (*or ideas*) *attended to and intellectually manipulated under the stimulus of feeling, and leading on to appropriate active decisions and endeavours.* In other words, our completed mental processes consist of (1) a stage of intellectual activity accompanied by feeling, (2) a stage of conative response.[1]

[1] The student who wishes to see this typical plan of mental process more fully described may consult Dr. Ward's article on "Psychology" in the *Encyclopædia Britannica*, pp. 39-44. As pointed out above, in certain cases, as when acquiring knowledge with no thought of immediate use, the conative responses may be said to be postponed.

Laws of Functional Activity. As remarked above, the aim of mental science after separating out by analysis the functions of mind is to ascertain the laws according to which they work. By this is meant a formulation in the most general terms possible of the conditions which are necessary to the due carrying out of a functional activity and to its full development. It is only when we can thus specify the conditions of a mental process that we can be said to understand or account for it. And a knowledge of the conditions on which the discharge of a mental function depends is of practical value since it puts us in a position to bring it about and to regulate its action.

Here too mental science is seeking to improve on popular psychology; for observation has long since taught men that mental products, such as intelligence and character, presuppose certain antecedent circumstances and influences, such as concentration of mind and repeated effort. This is seen in many common sayings, as "Experience is the best teacher," "Habit is second nature," "First impressions last longest," and so forth.

(*a*) Some of these laws of mind embody the general conditions of all mental functioning. Reference has already been made to the physiological conditions of mental processes, more particularly a vigorous state of the brain. This, it is evident after what has been said, is a preliminary condition of all normal and effective psychical activity. Among the more general mental conditions Attention is, as we shall see, by far the most important. Mental focussing or concentration is presupposed alike in all clear knowledge, vivid feeling and energetic willing. The laws of attention to be

spoken of presently are thus in a manner laws of mind as a whole.

(*b*) Next to these universal conditions, there are more special ones having to do with some particular mode of functioning. Thus there are special laws of intellectual activity, as for example those of mental reproduction or the revival of impressions. Similarly, there are special laws of feeling which seek to formulate the conditions of pleasure and pain. Finally, we have special laws of conation, as, for example, that the strength of effort varies with the intensity of the desire which prompts it, that near satisfactions arouse effort more powerfully than remote ones. It is to be added that, in assigning the special conditions of feeling, knowing and willing, we should refer to the particular nervous processes involved, so far as these are known.

Since mind is an organic unity, and its several functions interact one upon another, the enumeration of conditions will have to make reference to such interactions. For example, we shall see that feeling exerts a profound influence on the course of the thoughts. We are apt to think and believe what chimes in with our hopes and fears, our likes and dislikes. Again, since violent feeling, as intense bodily suffering or passionate anger, is unfavourable to intellectual activity, it is well to refer to the absence of agitating feeling as a "negative condition" of such activity.[1]

(*c*) Still more special conditions have to do with some particular mode or variety of the intellectual or

[1] A negative as distinguished from a positive condition means the absence of some opposing force which, were it present, would counteract the effect.

other function answering to what is popularly called faculty. Thus we may enumerate the special conditions necessary to accurate observation or to clear recollection. This gives us the law according to which that particular "faculty" is said to operate. For example, we explain a process of observation by specifying as its chief conditions, a favourable position of the object observed, a special interest in this object, and a certain preparedness of mind for understanding what is presented. Here too we must include in our survey the region of the nervous system specially engaged. Thus it is evident that accurate visual observation implies as its preliminary condition the normal keenness of vision. Further, we must, where necessary, refer to those *past* activities which are the pre-conditions of carrying out the present process. (*Cf.* above, p. 25.)

BEARINGS ON EDUCATION.

HOW THE TEACHER MAKES USE OF RESULTS OF ANALYSIS OF MIND. The process of psychological analysis just described has a direct and important bearing on the education of the mind. Every *intelligent* attempt to act upon another's mind must, indeed, be guided by some knowledge of its processes. Thus an orator who knows what he is about understands something at least respecting the nature of an intellectual process as well as the difference between an intellectual process and a movement of passion. A *perfectly intelligent* action of one mind upon another must be guided by a precise scientific idea of the mind's functions. The teacher who, under the guidance of the psychologist, has got to the bottom of the intellectual processes, and knows

precisely the elementary functions which enter into them, will, other things being equal, be best equipped for stimulating and guiding these processes.

To begin with, the new conception that mental processes are reactions of an organism, the carrying out of certain functional activities which are appropriate to it, is of importance to the educator as correcting an old and erroneous conception of teaching. This latter viewed a child's mind as something passive, as a receptacle into which we can somehow put ideas, or at best as a plastic substance on which as on wax we can stamp impressions. For all such *mechanical* conceptions we must substitute the *biological* conception that every interaction between mind and mind is an *organic process*, that in educating a child's mind we have to call forth, by a presentation of suitable stimuli, certain appropriate reactions. In getting a child to move his arm we do not act by mechanical processes on this organ, but excite its own proper activity by applying a stimulus to a connected sense-organ, as by touching his arm or by holding out an attractive object to his eye. In like manner, when we instruct his mind we present certain intellectual material, *viz.*, objects of sense or intelligible words, in order to excite those functional activities, attention, discrimination, etc., in which mental work consists. The idea that all intellectual processes are active functioning, elaborative reactions carried out on given materials, supplies a scientific basis for the modern educational maxim that in teaching we have to excite the child's "self-activity".

To a precise conception of what is meant by a mental function or functional reaction the teacher must add clear

insight into the nature of the several functions. This applies with special force to the elementary functions of intellect. I believe that every intelligent teacher will bear me out when I say that the singling out by modern psychologists of the process of discrimination as a fundamental or elementary function of intelligence is tending to revolutionise much of our educational work. To realise fully the simple and obvious-looking principle that all clear knowledge of things, whether gained directly by sense-observation or indirectly by verbal instruction, is a process of mental separation, of differentiation, of discernment, is already to have surmounted many of the giant obstacles which stand menacingly in the teacher's path.

Nor is it only by way of throwing a more searching light on the intellectual processes that this analysis is of value to the teacher. It was pointed out above that one who is an educator in the complete sense of this term aims at developing the mind and personality as a whole. Now a scientific analysis enables him to know this mental organism better, and to distinguish its several constituent lines of activity. I believe that the psychological recognition of feeling as a primary function of mind is destined to have important consequences for education. We are already beginning to recognise the importance of the feelings both as a force in child-nature and as an element of human worth. A study of the feelings seems to me to be absolutely indispensable to any one who would work effectively and beneficially on the growing mind of a child.

Use of the Synthetic Conception of Mind. While, however, this *analytic view* of a child's mind is

important to the teacher, being indeed the necessary starting-point in any attempt to lay hold of something so subtle and complex as a mind, it is not sufficient. The *synthetic view* must supplement the analytic: that is to say the teacher must get firm hold on the truth that the real living mind of a child is a unity, an organism, in which the functions which we mentally separate by our analysis are inseparably conjoined. Much of bad education in the past has been due to the want of this synoptic view, of the apprehension of the mind in its living concrete wholeness. We shall see by-and-by that dull, lifeless teaching is psychologically wrong just because it ignores the truth that all intellectual activity is fertilised and sustained by feeling in the shape of interest. And just as the educator may go astray by overlooking the vital connection and interaction of intellect and feeling, so he may err by overlooking that of feeling and volitional effort, by forgetting that all the exertion which is to further moral growth must be inspired by warmth of feeling.

VALUE OF A KNOWLEDGE OF CONDITIONS OF MENTAL ACTIVITY. While the teacher needs this insight into the several activities of mind and their connection, he needs further a clear understanding of the *conditions* of the normal and perfect carrying out of these activities. The new point of view, that teaching proceeds by exciting in the child's mind certain reactions, makes it necessary for the teacher to know first of all the internal conditions of this "self-activity," that is to say, the forces which rouse and determine the directions of the functional activity of a child's mind, and, on the other hand, which tend to obstruct and counteract its activity; and, secondly, how the

action of the teacher may modify these forces. Thus if I want to understand perfectly how I am to excite a child's attention to some object of sense, or some verbal description, I need to have a theory of attention, that is, a scientific account of this activity and of its conditions, and then a practical insight into the various means by which I can act favourably on these conditions, as by selecting what is interesting, by awakening curiosity, and by removing external causes of distraction or wandering of attention. We may express this practical truth by saying that *since the educator's action on the child's mind is essentially indirect, being effected by a calling forth and directing of its own functional activities through the medium of suitable presentations, it must in order to be intelligent comply with the known laws of these activities.*

REFERENCES FOR READING.

The student who desires to read further on the classification of the mental elements is referred to my *Outlines of Psychology*, chap. iii.; to Höffding's *Outlines of Psychology*, chap. iv., and to Dr. James Ward's article "Psychology," in the *Encyclopædia Britannica* ("General Analysis of Mind").

On the bearing of the analysis of mental processes on the division of Educational work the reader may consult Felkin's *Introduction to Herbart's Science and Practice of Education*, chap. i. The reader of German may with advantage refer also to Waitz, *Allgemeine Päd.*, § 6; and F. Dittes, *Grundriss der Erziehungs- und- Unterrichtslehre*, §§ 23, 24 and 86.

CHAPTER V.

MENTAL DEVELOPMENT.

In the last chapter we took a general survey of the system of activities which constitutes a mind, without reference to the successive stages of their development. We have now to inquire into the history of this mental organism, to ask how it comes to be the complex, mature thing which we can study in ourselves and other adults. This historical treatment of mind, and more particularly that part which traces the course of its early manifestations, will be found to be of the highest interest and value to the teacher. What the educator of the young wants to know more than anything else is how the primitive germs of human capability unfold themselves, in what precise order the mind passes from the lower forms of activity to the higher.

General Account of Mental Development. The processes making up the development of a human individual have already been touched on in our account of the Nervous System (see above, p. 34). We have now to examine them more fully.

The term development denotes that series of changes, both in form or structure and in function, which marks the progressive life of an individual organism. Thus we say that a plant goes through a course of develop-

ment as its various organs emerge or grow distinct, taking on their characteristic forms and carrying out their characteristic functions.

The terms "growth" and "development," though nearly related, are not synonymous. Growth refers to increase in bulk, and this, though it takes place normally by an increase in the number of elements, and so involves a measure of development, may be brought about in abnormal cases without any corresponding developmental changes. The essence of development is *advance in differentiation*, that is to say, the emergence of differences between part and part (compare above, p. 35). This is illustrated in the early stages of the life of every organism, in which out of a seemingly uniform or homogeneous substance different tissues begin gradually to arise and to form themselves into separate organs. Along with this advance in differentiation or "specialisation" of parts there goes advance in complexity, or what is known as integration of parts into a connected system (compare above, p. 35). This latter process may also be described as organisation. That is to say, the several parts differenced out one from another take on connections one with another, which connections are necessary to a harmonious functioning of the whole as a system or organism. Thus the development of a plant means that the several organs, as those of circulation and respiration, are brought into due relation one to another, so as to work together for the maintenance of the whole organism.

Mental development, which proceeds concurrently with cerebral development, is in its essentials similar to that of a physical organism. The mental life begins

with each of us as a state of vague, undifferentiated "sentience".[1] The life before birth (fœtal life) is, so far as we can conjecture, a state of "sub-consciousness," *i.e.*, a kind of drowsy or somnolent state, which is only occasionally disturbed by the intrusion of a sudden shock of rousing sensation. Even after birth, when the higher sense-organs come into play, we have at first to do with a confused sub-conscious state, in which not only are the sensations of the same sense, as those of blue, green and the other colours, confused one with another, but even the sensations of one sense are not clearly distinguished from those of another sense. At this stage, too, feeling, in the shape of varying discomfort and comfort, is confused with sensation, while the "me" and the "not-me" are not yet distinguished. In this period, indeed, we can hardly speak of any well-marked manifestations of the three functional activities: all is a kind of undefined misty void.

Development means the gradual displacement of this sub-conscious, drowsy state by a wakeful state, in which differences or changes are noted and take on definiteness. To begin with, the several classes of sensation, as those of sight and hearing, become differentiated one from another. Later on, sensations produced by external causes come to be distinguished as "presentations" from the changes in the "feeling-tone" to which they severally

[1] The term "sentience" is here used for the first raw mental material which is furnished by the senses, and out of which distinct sensations, such as those of sight and of hearing, are gradually differentiated. It corresponds to the "protoplasm," out of which the organs of the body are gradually developed.

give rise.[1] By a further process ideas are differentiated from sense-presentations, and so on. Along with these processes of differentiation there go those of integration or organisation spoken of above. Thus sensations become grouped in what we call complex presentations: *e.g.*, the several visual sensations which an infant receives when looking at its mother's face, hair, dress, etc., become integrated into the visual presentation of the mother. In like manner, ideas are brought into connection one with another, as when the idea of falling is associated with that of a blow, and thus the processes of thought become possible. Lastly, each part of the mental life is duly co-ordinated with the other parts, feeling with thought, and both with volition, in what we call a consistent and harmonious whole.

This complex course of change may be roughly shadowed forth by the following diagram :—

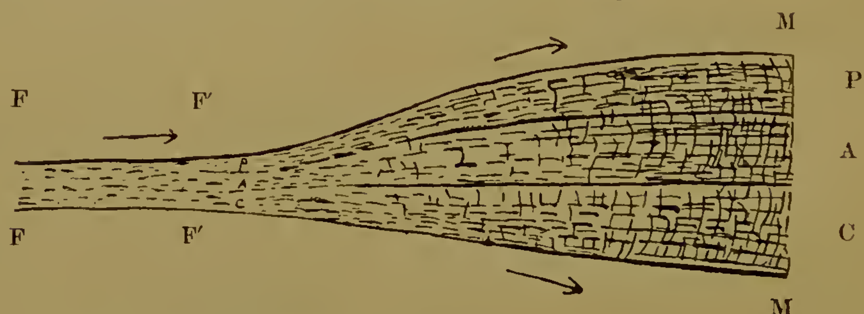


Diagram illustrating the process of mental development in the individual. FF′, stage of fœtal life ; F′M, from birth to maturity ; P, A, C, presentative (intellectual), affective, and conative phases, as gradually differentiated and interconnected.

THE BIOLOGICAL THEORY OF MENTAL DEVELOPMENT. This typical course of the mind's development is, as already pointed out, dependent upon the processes of bodily or organic development. We may, indeed, view

[1] On the meaning of these technical terms see above, pp. 46, 47.

the changes making up the intellectual and moral development of a child as forming a part of its whole life-history. More particularly these changes are found to proceed step by step in close connection with the development of the nervous system. They are, moreover, profoundly affected by certain changes in other organs of the body, as the important organic changes introduced by puberty. It will be necessary therefore to supplement the above short account of the general course of mental development with one or two references to what the modern science of biology tells us of its organic conditions.

Development as Predetermined by Racial Heredity. One of the most important points in the modern doctrine of evolution is that it exhibits the series of changes which make up the typical course of development in a child, mental as well as bodily, as *organically predetermined.* Every child inherits in connection with his organism instinctive tendencies to carry out the several functional activities of intellect, feeling and conation ; and the sum of these tendencies forms the basis of his whole mental development. This inherited tendency to take on gradually the typical characters of the human species or race (mental as well as bodily) may be described as Racial Heredity.

It follows from the new way of regarding this racial inheritance which has been introduced by the doctrine of evolution that the order of unfolding of characters, both organic and mental, *conforms in its larger features to the order of unfolding as it has taken place in the evolution of the race.* Just as the gradual unfolding of the bodily form of a child repeats or "recapitulates" the

principal stages in the gradual evolution of man from lower forms, so the gradual unfolding of his mental powers "recapitulates" the process of racial evolution. This general harmony or parallelism is illustrated by the comparatively late appearance in the child of speech, a power which was developed in the race only when man stepped out of his animal condition. Again, it is easy to see that the forms of mental activity first developed, *viz.*, sense, movement, instinct,[1] are precisely those of the higher animal plane, and are, moreover, proportionally strong in the lowest races of mankind. Similarly, some of the characteristic forms of intellectual activity in child-life, such as the fanciful transformation of objects of perception, the belief in fairies and other supernatural beings, have their parallel in the early stages of the life of the race, so far as this is known. This principle has been made much use of in modern theories of education.

Another important point connected with this new theory of Racial Heredity is *the exceptionally long time required for the development of a human organism and its mental aptitudes.* If we take a member of one of the animal species, *e.g.*, a dog or a cat, we find that within a year or two all the main stages of development, both bodily and mental, have been run through. The human offspring, on the other hand, requires many years for going through its series of

[1] The student must beware of the treacherous words, "instinct," "instinctive". They are sometimes used to cover *all* that is original and not acquired by individual experience. In this sense they include all that I have included under "racial heredity". Sometimes, again, they are used in a narrower sense for original impulses towards particular movements, as when we speak of sucking, walking, expressing anger by blows, as (in part at least) instinctive.

developmental changes. This difference is connected with the fact of the great complexity of human life as compared with animal life. A dog requires for the discharge of its life-functions but little experience, and, being well equipped with a number of useful instincts, develops its brain quickly; a child, requiring for the many different actions of civilised life a high degree of intelligence, which can only be obtained gradually by help of experience, develops its brain slowly.

One feature of this prolongation of the period of mental development in man is of especial interest, *viz.*, *the lengthening of the period of infancy, that is of extreme dependence on others.* It follows from the very complexity of the process of normal development in man that a child must remain for a much longer period than the offspring of any other species helpless, dependent for its maintenance and security on others. It seems probable that the duration of the period of infancy varies with the complexity of the organism.[1]

Here reference has been made merely to the action of racial heredity in predetermining the lines of development in the child. It remains to add that this force of heredity must be supplemented by what the biologist calls "the interaction of the organism with its environment,"[2] *i.e.*, by individual experience and education,

[1] For a fuller account of the new view of infancy, see an article by Professor N. Murray Butler on "The Meaning of Infancy" in the American *Educational Review*, Jan., 1897.

[2] By "the environment of an organism" the biologist understands that part of its surroundings which acts upon it. Thus, nutritive materials, light and heat, are a part of the environment of a plant. "Interaction" implies that the organism *responds* to this action of its environment, as when a plant turns towards the light.

before the full normal course of development can be realised. Even a dog or a cat only fully realises and perfects its congenital aptitudes, for example, that of running and killing its prey, by help of a certain amount of individual life-experience and exercise of power. And this action of experience is still more plainly seen where the animal has *to adapt itself to new circumstances*, as, for example, when a fox, hard pressed by hunger, *learns* to make use of the resources of the barnyard. This need of experience applies much more obviously to the child, who has so much less of "ready-made" instinctive aptitude than one of the lower animals, and is consequently much more dependent on the environment;[1] and who, moreover, has to carry out a much wider range of adaptation to variable circumstances.

By the help of this brief preliminary account of the process of mental development and of its organic conditions we may now examine with some care the precise forms and the underlying principles of the mental development of a child.

Psychological Theory. In seeking for the principles which enter into and determine the processes of mental development, we may confine our attention at first to the progress of intelligence, as being the most interesting aspect of mental advance, as also the aspect which is most easily understood. To begin with, then, it is obvious that a part of what we mean by intellectual

[1] This action of this environment on the child's growing mind, here briefly touched on, and the part which instinct and heredity on the one hand, and experience and education on the other, have to do in bringing about full normal development, will be dealt with more fully by-and-by.

development is expressed in the popular saying that every function, and special functional modification or "faculty," of the mind grows by repeated exercise. A child's mind pushes on in the path of development by gradual improvements of its powers, such as attention to sense-presentations, and discrimination and assimilation of these. When, for example, he has once learned to discriminate two colours, say green and red, he will go on to discriminate another pair, as blue and yellow, and, as a result of repeated exercises of this kind, to discriminate more finely, as between yellow and orange. In other words, the processes of development consist in part of *successive improvements of the original functional activities of the mind.* This covers what is rather carelessly described in popular language as the improvement of a "faculty," as when we say that a child is developing "a faculty of observation".

Order of Development of Faculties. This gradual improvement of the several modes of functional activity is, however, clearly not all that we mean by the development of the intellect. As was pointed out in the above slight survey of the process, development means a passing from earlier simpler forms of intellectual process to later and more complex forms. Thus sensation is followed by the comparatively complex process which we call "the perception of an object".

This side of mental development is specially indicated by the familiar proposition of modern psychology that the "faculties" unfold in one uniform order. The term "faculty" here refers to a specialised variety of intellectual process, such as observation by the senses (*cf.* above, p. 49). Adopting the term in this sense as a

convenient one, we may say that the "faculties" of intellect emerge in the following order :—

(1) The starting-point of the intellectual life is Sensation, or the reception of sense-impressions by way of the several organs, the eye, the ear, and so on. In other words, the beginning of the intellectual life is the supply of that sense-material which the intellect elaborates according to its own laws. A child knows nothing about the external world until the senses come into play, and convey impressions of its colours, forms, sounds, etc. Along with Sensation we have to take movement, which, as we have seen, is organically connected with it. (2) Out of Sensation arises the first stage of cognition proper, *viz.*, the process of Perception (Sense-observation) in which a particular group of impressions is discriminated from other groups, connected as a whole, and recognised under the form of a thing or "object". In this way a child learns to know its ball, on seeing it, on touching it, or on hearing it bounce. (3) Out of Perception again arises gradually Representative Imagination or Memory, the process by which the mind recalls, and has an image of, what has been previously perceived. This higher plane of the intellectual life is often marked off as Ideation. Such imagination or ideation may be either direct, representing what has been perceived in its original form (Reproductive Imagination), as when a child in the dark recalls the face of his mother ; or it may be indirect, involving the representation of sense-objects in new and altered forms (Productive Imagination), as when out of the images of his maid and his sister he forms the new image of Cinderella. (4) Finally, there gradually appear those highest forms of cognition

which we call Thinking, in the correct sense, *i.e.*, thinking by means of general ideas, such as "man," "good". According to the common account, these processes of thought include Conception or the formation of such general ideas (which in their perfect form are called general Notions or Concepts) out of particular percepts and images, as when the general idea "good" is reached by comparing this and that particular action which are called good; Judgment, or the predicating something of a subject, as when a child says that his nurse is naughty; and Reasoning, or the process by which we infer new judgments from judgments already known, as when a child argues that nurse ought to be slapped because she is naughty.

It is evident from an inspection of this scheme of development that our intellectual life is ever moving farther away from its starting-point, *viz.*, the senses. The processes of elaboration, while presupposing the accumulation of sense-material, mean a gradual withdrawal from the mere life of the senses. It begins with attention to and assimilation of *outer* impressions; it passes on gradually to *inner* processes (imagination and thought) detached so to speak from the work of the senses; or, as it may also be expressed, our intellectual progress begins with *presentations*, and moves towards *representations* or internal substitutes for presentations. And the more the progress advances the farther is this process of substitution carried; memory-images being more closely related to percepts than are new images which involve a process of production or transformation, and these last again more nearly related than are general ideas or "notions".

Explanation of Scheme of Development. That this scheme roughly describes the actual order of events is at once apparent. Every child must have his sense-organs acted upon and receive impressions of sense again and again before he learns to perceive even so simple an object as his mother's face. It is equally indisputable that he can only have images and recollections of things after perceiving them, and that a certain development of perception and imagination precedes general thinking. The scheme clearly lays down the broad features of intellectual advance, and marks out for the teacher the main divisions of his work, the training of the senses, the memory and the imagination, and the reasoning powers (thought).

A word or two must, however, be added in order to avoid misapprehension. In speaking of the inner life of imagination following the outer life of sense-observation, and of abstract thought or reasoning following the pictorial imagination of concrete things, psychologists do not mean that there is first a period, say that of infancy, *wholly given up* to sense-perception, that this is followed by another wholly given up to imagination and so forth. Memory begins to come into play at a very early stage of infancy, and though waiting, so to speak, for its advance, on perception develops along with this. All that is meant, then, by this chronological sequence is that *the earlier processes reach a well-defined character before the later, and that the fuller development of the later processes presupposes a sufficiently full development of the earlier.*

It is to be added that while there is thus an advance from sense to thought there is a reverse action of

thought on sense. As we shall see later, our cognitions of things through the senses only become clear and well defined by the work of thought.

Another caution is no less necessary. In speaking of these successive forms of our intellectual life under the head of "faculties," as Perception, Memory, and so forth, the psychologist is using the popular term "faculty" in the sense defined above. A deeper scientific analysis shows us that *throughout this complex movement of intellectual advance we have to do with the same elementary functions of mind.* We shall see as we go along that what we call a process of perception consists of the exercise of the primary functional activities of intellect, *viz.*, discrimination, assimilation, and association, upon sense-materials, under the lead of that simplest and most fundamental mode of mental activity which we call (selective) Attention. In like manner we shall see that the higher processes, *viz.*, those of imagination and thought, consist essentially of the same functional activities, *employed about the results of the earlier elaborative processes.*

INTELLECTUAL DEVELOPMENT DUE TO PROGRESSIVE EXERCISE OF FUNCTIONS. It was pointed out above that the process of intellectual development is explicable in part as the result of gradual improvement in the working of the functional activities (discrimination, etc.), these improvements being brought about by a progressive series of exercises. We may now see that the whole of the process is explicable in the same manner. If we regard Perception, Imagination and Thought as alike the outcome of the workings of the fundamental intellectual functions we may say that the appearance of

any later stage, *e.g.*, general thinking, depends upon a proper and adequate exercise of these functions at a lower stage. In other words, the work of the mind, in taking apart and organising its sense-material, which leads immediately to perception, prepares the way, after images have been gathered in sufficient number, for that higher intellectual work of thought which we call analysis and synthesis.[1]

MENTAL DEVELOPMENT AND RETENTIVENESS. The development of intellect here briefly described clearly implies a mental property not yet dealt with, *viz.*, that known as Retentiveness. By this term in its widest signification is meant that all which we think, feel and do leaves us permanently disposed to think, feel and do in a like manner in the future. A child that observes a thing closely is in so doing forming a lasting disposition to observe things closely. This is commonly explained by saying that every operation of mind leaves a permanent *trace* behind it. What such "traces" are we do not certainly know. It is probable, however, that permanent changes in the nervous centres corresponding with the particular modes of functioning carried out lie at the basis of such "tendencies," so that they are more correctly described as *psycho-physical dispositions*. The law that the nervous structures are modified by and adapted to repeated modes of functioning plainly underlies the generalisation, "Exercise strengthens faculty".

RETENTIVENESS AS HABIT. This formation of psycho-physical dispositions is the basis of what we call Habit. When we say that a person has a habit of thinking in a

[1] On the meaning of "analysis," see above (p. 44). Synthesis is the complementary process, *viz.*, mental combination.

particular way we mean that as the result of repeated acts of thought he has got into a fixed manner of thinking. The formation of habits is a very important ingredient in the growth of intellectual aptitudes. As we shall see, we learn to think rapidly and easily by forming habits of attention, and by laying down firm and smooth paths of thought, along which we can move readily.

Habit is, it is true, by no means the same thing as development. Habit refers rather to the fixing of mental activity in certain definite directions. Taken in this narrow sense, it is in a manner opposed to development in the sense of further adaptation. By frequently following out a particular train of ideas in a certain way, we may lose the capability of varying this order. In this way a child is apt to acquire lasting *prejudices of thought* towards persons, modes of occupation, and so forth. Habit represents in our mental life the effect of custom, the *conservative* tendency; whereas development implies as its fundamental condition a certain flexibility of mind, a modifiability of the nervous apparatus, and stands for the *progressive* tendency. It is thus, like heredity and congenital instinct, a force which is opposed to new adaptations. Nevertheless, the essential principle of habit enters into development itself. As we shall see later on, it is only as a child masters by repetition a simple action, so as to get perfect ease in carrying it out, that he is in a position to go on to a more complex action. Thus a child must attend again and again to single objects, say, one of his mother's eyes, before he can direct his attention *to both eyes* so as to compare them.

RETENTIVENESS PROPER. In order that the intellectual powers as a whole may be developed, a higher form of

retentiveness is needed. That is to say, the traces of the products of intellectual activity must accumulate and appear under the form of *revivals* or *reproductions*. As pointed out above, the presentations of sense when attended to and transformed into observations are in this way recalled as mental images. This is retentiveness in its proper sense. We can only speak of a *mental* retention of impressions when these are capable of being "recalled" as images or "representations". This revival of the products of sense-observation is necessary to the higher intellectual operations, for it is these images which, as we have seen above, supply the material for the more elaborate processes of thought. The rise of such free images marks, as we shall see, an epoch in a child's development. For it is only when they appear and become steady and well defined that he is able to go back mentally on his past experience, to compare the present with the past, and to begin to arrange and classify things according to their common features or characteristics.

These processes of reproduction involve, as I have already pointed out (p. 48), the integrative work of association. When a child has an image of his absent mother it is because this image is *suggested* by some associated presentation, as hearing the sound of her voice, or seeing her empty chair. The whole process of intellectual development may be viewed as a growing complexity due to ever new associative combinations. A child's knowledge of his mother, of his home, of the garden where he plays, and so forth, is continually expanding by the addition of new associated facts or experiences. The same is true of the develop-

ments of thought. Here, too, we shall find that with the simplification which goes along with arrangement and classifying there goes widening of connections.

DEVELOPMENT OF FEELING AND WILLING. While for the sake of simplicity we have here confined our attention to the development of intellect, it may be added that the same features and the same underlying principles are discoverable in that of feeling and willing. The earlier feelings, the so-called "bodily" pleasures and pains, are simple, and have a presentative character as being the accompaniments of sensations; whereas the higher feelings or emotions, such as fear and love, are complex, and involve a good deal of the representative or imaginative element. In like manner we find that the earliest manifestations of conation are those outward responses to sense-stimulation which we call bodily movements, such as grasping at an object with the hand, crying when the craving of hunger sets in. In contrast to these the later are complex processes, marked by a good deal of the internal and representative element (reflection, deliberation, etc.).

It will be found further that there is the same continuity of development in each of these two phases of the mental life. And the same general conditions, *viz.*, repeated exercise, and retentiveness and association, will be found to be illustrated here as in the case of intellectual development.

INTERDEPENDENCE OF INTELLECTUAL, AFFECTIVE, AND CONATIVE DEVELOPMENT. We have so far viewed the growth of intellect, of feeling, and of volition as processes which can go on apart, independently one of another. This, however, is a very inaccurate assumption. It has already been pointed out that mind is an organic unity,

and that the processes of knowing, feeling, and willing are vitally interconnected. It follows from this that the developments of these phases of mind will be closely connected. Thus, as we shall see more fully by-and-by, the development of intelligence involves at each stage a certain development of feeling and of active exertion. A child would make no progress in knowledge if he had not the necessary "interests"—which, as we shall see, mean pleasurable associations with what is observed or heard about—as well as the requisite active processes (concentration, application). Conversely, the life of feeling expands and grows rich and varied through the accumulation of knowledge about nature and man; and all the higher processes of volition wait, so to say, on the development of feeling and the acquisition of practical knowledge. Although it is no doubt true that a child's mind may develop in a one-sided way, that is to say more on one side than on the others, it is equally certain that *development in any one direction implies a measure of development in the other directions.*

This connectedness of each side of development with the others is strikingly illustrated in the close dependence of intellectual growth on the exercise and improvement of the power of Attention. Though clearly a manifestation of the active or conative side of mind, attention is, as we shall presently see, a prime condition of all the intellectual processes. What we call mental *activity* always has reference to the active exertion which constitutes attention; and the higher forms of mental activity, as illustrated in the disciplined mind of the student, involve, as we shall see, the full exercise of the will in the shape of an effort of concentration,

FACTORS IN DEVELOPMENT. The process of mental development here briefly traced is, as pointed out above, the outcome of certain original or "congenital" tendencies of the child.[1] It would be an error, however, to suppose that these are all that is necessary to a full normal development of a child's mind. An organism develops, as we have seen, through a series of interactions with its environment. The same is true of a human mind. A child's intellectual activity and his impulses towards movement are aroused, as I have said, by the action of surrounding objects on his senses. To this must now be added that the human individual realises himself intellectually as well as morally only so far as he comes into contact with others, being acted upon by their thoughts, feelings and actions, and in turn adjusting his thoughts, etc., to theirs.

We may say, then, that the typical process of development of a human mind implies two things, (*a*) normal congenital capabilities and (*b*) suitable surroundings. The first may be marked off as the *Internal Factor*, the second as the *External Factor*, in mental development.

(*a*) INTERNAL FACTOR. Keeping for the present to the common typical plan of development and ignoring its individual variations, we may say that this process presupposes first all that is included in the congenital aptitudes and dispositions of a human being. Thus it plainly includes the several simple modes of sensi-

[1] Congenital is what belongs to the organism at birth, something original and instinctive, as distinguished from what is acquired. It is the scientific term answering to the popular term "innate". All that is inherited from ancestors is of course congenital.

bility, to light, to sound and so on, in their normal forms. Further, it embraces the germs of those capabilities which I have called intellectual functions, *e.g.*, discrimination and assimilation. In like manner it will include the primary or fundamental capacities of feeling, *viz.*, susceptibility to pleasure and pain in its simpler forms, as well as the instinctive impulses to act which form the natural basis of conation. These last must be taken to include the child's *instinctive impulse towards development*, the natural basis of the desire to grow in knowledge, power, and so forth.

This congenital basis of what we call a normal human mind will, as has been implied above, include a normal bodily organism. A proper equipment in respect of the organs of the nervous system—particularly those of the brain-centres, and of sense and movement—is the fundamental condition of a full human experience. The importance of properly developed and efficient sense-organs and organs of movement is seen in the arrest of mental development which accompanies serious defects of these, whether congenital or, as in the case of the celebrated American child, Laura Bridgman, the result of illness.

The natural outfit of a normal human mind, here briefly described, is the product of what I have called Specific or Racial Heredity (see above, p. 63). It represents the sum of endowments of which the human species has gradually possessed itself during its long process of evolution, and which is preserved for each successive generation by what we call inheritance.

How far this basis of common endowment due to race-inheritance extends is a disputed point. According to the "Lamarckian view" of

Mr. Herbert Spencer and others, the ancestors of children may hand on to them by means of a greater natural brain-endowment some of the results of their own experience and exertions. That is to say, the human brain of the offspring preserves in certain inherited structural arrangements and functional dispositions the fruit of its ancestors' industry. In this way, for example, a child of modern European parents, aided by such transmitted results of ancestral experience, can more quickly learn to reason about cause and effect, and is more disposed to obey rules and to act morally, than a child born ages ago. Others, as Professor Weismann, hold that nothing which has been acquired by parents can be transmitted by heredity to their offspring. The point is of some interest to the educator in this way. According to Spencer's view, the teacher of to-day has somewhat better material, both intellectual and moral, to work upon than his predecessor of centuries ago. On the other hand, according to Weismann's theory, the teacher who aims at a higher intellectual and moral result than his predecessors has to rely exclusively on better social surroundings, and a more perfect system of education.

(*b*) External Factor. (1) Natural Environment. This primitive and congenital organic basis being assumed, we require further the presence of appropriate external conditions and agencies. Thus it is evident that the growth of a child's intelligence presupposes the forces which act upon the sense-organs and excite what we call sense-impressions, together with space or room for those movements, which, as we shall see, contribute to our knowledge of things. Deprived of these external conditions, a child's congenital disposition to form perceptions and ideas of things would remain undeveloped, his rudiment of mind would remain but a rudiment. This need of the appropriate agencies for exciting the activity of the senses, and through these of the understanding, is strikingly illustrated in the famous history of Kaspar Hauser, the German boy who, brought up in darkness and solitude, with but few objects of sense to

arouse mental activity, had at the age of sixteen hardly more mind than a baby.[1]

(2) THE SOCIAL ENVIRONMENT. In addition to what we commonly call the Natural or Physical Environment there is the Human or Social Environment. By this we mean the community, of which every individual child is a part, to which from the first he is bound in certain relations of dependence and obligation, and by which his whole mental life is profoundly influenced.[2] The action of this social environment, like that of the physical, affects the child's mind through the medium of sense-impressions, *e.g.*, the sounds of the mother's voice; yet it differs from the action of the natural surroundings in being a *moral* influence. It works through those social and moral forces which bind the individual to other individuals, such as imitation, sympathy and the sentiment of authority.

The presence of a social medium is necessary to a full normal development of mind. If it were possible to maintain a child in bodily health and at the same time to deprive him of all companionship, his mental development would be but rudimentary. Kaspar Hauser's almost idiotic condition was due in no small measure to the absence of human society. The stories of children left to run wild in the woods illustrate still more clearly

[1] See the article on Kaspar Hauser in *Chambers' Encyclopædia*; and for a fuller narrative the *Quarterly Review*, 1888.

[2] In educational works this human environment is often spoken of as "the environment". This, however, is an inexact use of the term.

this need of the social environment.[1] It must be evident to any one who thinks about the matter that a child's intellectual growth is brought about to a large extent by continual contact and interaction with others' intelligence, by a gradual initiation into the store of intellectual wealth amassed by the race, and embodied in everyday forms of language and in books. Similarly the feelings of the child can only quicken and develop to the normal fulness and variety under the fostering influence of daily companionship, with its free interchange of the signs or expressions of human emotion. And, finally, it is certain that a normal development of volition with its higher motives, as obedience, the desire to please and so forth, will only be realised when there are present a human and humanising environment, and all the forces of example and warning, and all the subtle and penetrating influence of a moral atmosphere.[2]

UNDESIGNED AND DESIGNED INFLUENCE OF SOCIETY. A part of this social influence on the unfolding mind of a child works undesignedly, that is, without any intention on the part of parent or other companion to accomplish a beneficial result. The mode of action of the daily contact of a child's mind with those of

[1] A famous story of a child brought up quite wild in the woods of Lithuania is referred to and made much of by some of the earlier psychologists. See for example Condillac's *Traité des Sensations*, 4me partie, chap. vii.

[2] Rousseau's proposal that a child should be withdrawn from human companionship till the age of twelve was based partly on his idea of the corrupting influence of society, partly, however, on the notion that during these first years a child is non-rational, and therefore not a proper subject for moral training.

other inmates of the house, of the suggestive and directive influence of example, of the prevailing intellectual and moral atmosphere of a home, resembles in a manner the action of natural or physical agencies. At the same time it must be borne in mind that these social influences are the results of human progress, and of that civilisation which our ancestors have slowly built up for us.

From these undesigned influences we must distinguish those designed agencies which constitute education in its proper and all-comprehensive sense. A child comes from the first under the controlling efforts of the mother and nurse, of older sisters, and so forth. Instruction begins by the pointing out of objects as well as the presenting of these, *e.g.*, pictures. And along with such intellectual control there goes moral control, the checking of naughtiness by gesture-language, the erect finger and the "Hush," later on the laying down of commands and the apportioning of punishment and reward. In later years society continues to work designedly on the young character through the constant pressure of established rules of behaviour, and through the moral exhortation and suasion of elders, of literature, and of the pulpit.

Both kinds of social influence must co-operate in order to the development of each of the three great phases of the mental life. Kant has taught us—what Rousseau sadly failed to see—that every individual becomes human by education, that in order to the full realisation of human capability and human life each of us has to be subjected to the educative influence of the home and the community. Thus the intellect of a child grows, partly under the influence of contact with the social intelli-

gence reflecting itself in the forms of language, in traditional sayings, and so forth; and partly by the aid of a more or less systematic instruction. Similarly feeling develops partly through the habitual contact with other minds and the play of sympathy, and partly by direct appeals from others. Finally the will develops partly by the attraction of example and the impulses of imitation, and partly by the forces of suasion, advice, reproof, and the whole system of moral discipline.

It may be added that *this action of the environment*, both physical and social, *increases in range as the child's mind develops.* Thus at first a child is acted upon by, and reacts upon, only a few objects, those which lie near at hand, and which attract him by their striking colour or other interesting feature. As he advances he observes a larger and larger number of objects, including the hills far off, the sea he visits in the summer, as well as the flowers in his garden. Similarly, as he grows, he interacts with a larger and larger social environment. The influence of the home, and the adjustment of actions to those of its rulers and its playmates are supplemented by the wider influence of the school, of friends, and of public opinion, and by the more complex adjustment of actions to those of the community.

The reader may perhaps be the better able to comprehend the co-operation of instinctive tendencies with the growing action of the surroundings by help of the following diagram :—

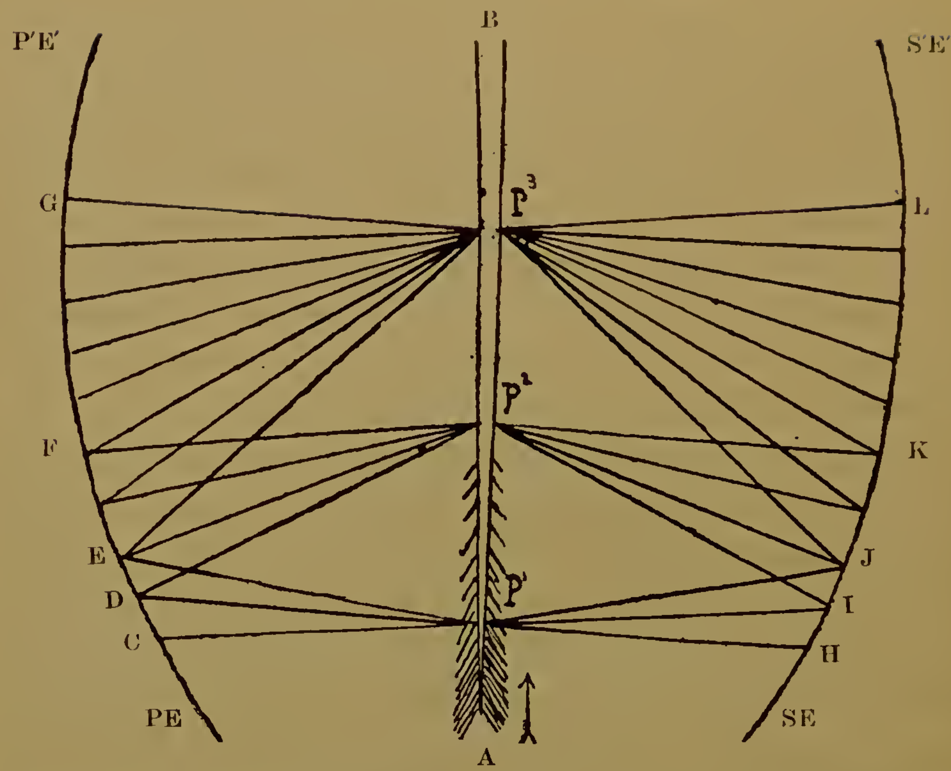


Diagram of mental development showing the growing interaction between the mind and its environment. AB, line of development, with congenital tendencies marked on the lower section. PE-P′E′, physical environment. SE-S′E′, social environment. The pencils of radiating lines from the points P^1, P^2, P^3 to CE and HJ, DF and IK, EG and JL, respectively, represent the increase in area of interaction with each environment as development progresses.

This scheme is intended merely to indicate to the eye the several co-operant factors in mental development. The student must beware of giving to these any separate existence. *The mind and its environment only exist as correlated one with the other.* Thus, strictly speaking, mind remains merely an unrealised possibility apart from the action of the forces of its environment; and on the other hand physical and social agencies only become an *environment* by being brought into active relation to a living mind.

Not only do mind and environment thus imply one another ; there is necessarily an *interaction or reciprocal action between the two.* If the environment acts (by way of the sense-organs) on the germ of a child's intelligence and feeling, the mind reacts on the environment. By this is meant two things. (*a*) It alters the environment by way of movements of the organism. Every time a child walks from one room to another, or alters the distribution of objects in a room, *it changes its environment.* (*b*) It reacts by way of special interest and selective attention so as to determine what particular agencies in the environment shall effectually influence it. By attending to colours, to musical sounds and so forth a child may be said to *select* these as his own innermost environment. Similarly he helps to determine the action of the persons about him. Hence we may say: *Mental development proceeds by the action of environing things and persons which stimulates certain congenital tendencies, and is supplemented by the growing mind's own selection of its stimuli.*

Varieties of Development. While all normal human minds pass through the same typical course of development, there are countless differences in the details of the mental history of individuals. In no two cases, indeed, is the process of mental progress precisely similar. Even the children of the same family, who may be presumed to inherit a similar type of organism and brain, and also to be subjected to similar environmental influences, begin to follow divergent lines of development from the first. Such diversities of mental history answer, it is clear, to the differences between mind and mind spoken of in the previous chapter.

These divergences may be referred to one or both of the two factors distinguished above, *viz.*, (*a*) variations of congenital tendency, and (*b*) differences of environment, physical and social. All differences in the final result, that is the mature or developed mental characteristic, must be referred to differences in one or both of these co-operant factors.

Differences of Congenital Tendency. That children exhibit differences of movement, gesture, as well as of sense-power, attention, and so forth, is a fact well known to every intelligent parent and physician. Yet it is by no means easy to make sure that differences which appear as early as the third year are to be set down wholly to congenital tendencies. We must remember that the action of the environment begins from the first, and that parental training is a great modifying factor even during the period of infancy. Although, however, it may be impossible altogether to eliminate the effect of early influences, yet we can reduce this to a minimum by taking a child soon enough, and by carrying out our observation in a methodical and scientific way.

Such investigation applied to young children has already begun to confirm the opinion that they are at birth endowed with very unequal degrees of capacity of different kinds. Each child is something unique: a single instance of a particular group of aptitudes and tendencies of certain relative strengths. This peculiar grouping of aptitudes and tendencies constitutes what is popularly styled the child's *nature*, but is better described as the *natural basis of individuality*. This congenital germ of individual character is determined by the peculiar structure of the child's physical organism, more par-

ticularly his nervous system. The original formation and the functional ability of the brain, of the sense-organs, of the muscular system, and to some extent even of the lower vital organs, all serve to determine what we call the native idiosyncrasy of a child.

It is to be added that these congenital differences are further important as determining what constituents of the environment shall act upon the senses. This is strikingly illustrated in *the selection of environment by the born musician or other artist.* The boy-painter in a family is surrounded by the same things as other members of it, but because of the congenital basis of a special interest in colours and forms he observes things which the others do not observe, and so practically creates his own individual environment within the common one. Other and more "ordinary" children select their environment, too, though in a less marked manner. *Place two children among the same surroundings, and they will not be acted upon in the same way by these.*

Heredity and Individuality. According to modern science these congenital differences of mental characteristics are in part at least illustrations of the principle of heredity already touched upon. Indeed, when we speak of heredity we are apt to think of the transmission, in connection with the organism of the child, of peculiarities of the parents or of the family. Just as bodily characteristics of parents, *e.g.*, facial feature and expressive movement, reappear in their children, so intellectual and moral traits are apt to be transmitted, in connection with certain peculiarities of the nervous organism, in the shape of inherited mental tendencies.

The transmission by heredity of mental characteristics

other than that of the common human lineaments (racial heredity) presents itself in a more extended and in a more limited form. There is, for example, the transmission throughout the members of a particular race or people of its characteristic group of physical and mental features. In this way we get the preservation of the Celtic, and more particularly, say, of the Irish type, including its characteristic temperament and mental traits. A more restricted and variable mode of inheritance is that of family characteristics, and this is the aspect of heredity which has most interest and practical importance for the teacher. We can sometimes trace throughout the members of a family certain common features of face, gesture, voice, etc., as well as mental and moral characteristics. Such distinguishing traits, again, though not observable in all members of a family, are apt to reappear now and again. An interesting example of this recurrence is to be met with in the transmission of a definite kind of talent through generations of a given family, as for example of high musical ability in the Bach family.

It is evident, however, that the members of one and the same family show marked diversities as well as similarities. We often remark, indeed, on the striking contrasts of ideas, feelings and inclinations among children of the same family. Such contrasts may be only another illustration of the action of heredity, some members of the family representing the traits of one parent, or of one parental line of ancestors, while other members represent those of the other parent or parental line. If we could trace back the organic ancestry of a child through its many divergent lines, we might probably be able to recognise in the peculiarities of that child reappearances of, or "reversions to," remote traits.

Yet we are far from being able as yet to resolve all individual traits into new combinations of ancestral characteristics. Hence though a knowledge of a child's family history is often of great service to the teacher, as it is to the medical man, in enabling him to understand the appearance of certain characteristics, its value is as yet greatly circumscribed. In much of what constitutes the idiosyncrasy of a child we can see only the result of nature's tendency towards what has been called spontaneous variation, *i.e.*, ever fresh modification of type, a tendency which seems to be the more clearly marked the higher we ascend in the scale of living things.

VARIETIES OF EXTERNAL INFLUENCE. While congenital peculiarities of mind, composing what is sometimes called natural temperament and character, thus play a considerable part in individual development, they are not the sole agency at work. In the case of average children, at any rate, differences in the surroundings, the physical and still more the social, have much to do with the differences of ability, disposition and character that soon begin to manifest themselves among them.

The important thing to bear in mind here is that no two children ever come under precisely the same environmental influences. Even twins, who are born into the same family at the same time, have from the first a somewhat different *social* environment. Their own mother is hardly likely to feel towards them, or to treat them, in quite the same way; and others are wont to show this divergence of feeling and behaviour very much more. These dissimilarities in the action of the environment must be allowed for even though it is true that the amount of divergence in the lines of develop-

ment may be much greater than the amount of the dissimilarity in the environmental action. As the years advance the sum of the external influences which help to differentiate individual character increases. The school, the place of business, the circle of friends, and so on, all contribute to determine the development of the particular stamp of mind and character of the individual.

That even such slight differences in surroundings must produce a certain effect follows from psychological laws. The mind develops by interactions with the environment, by responding actively to its stimulation, by assimilating its nutritive material, sense-presentations. The lines of its growth will no doubt be broadly limited by congenital capabilities and tendencies, including those special dispositions *to select environments* which have been spoken of above. Yet these do not exclusively fix the lines of development. Thus, though a child may have by nature special aptitudes and tastes which lead him by preference to attend to and assimilate a certain order of impressions, say those of colour, the question whether his mind is to develop vigorously in this direction will turn on the presence or absence of a sufficient supply of the required sense-stimuli, and on the frequency and strength of these as compared with others. The same is true of the development of moral traits. A child may have the natural basis of a sympathetic disposition, but he will not grow into a sympathetic human being if the germs of feeling are not fostered by suitable social influences.

It is impossible in the present state of our knowledge to say how much of the diversity of intelligence and of character that we find among men is referable merely to the superior force of this and that congenital tendency,

how much to the selective action of surroundings, more particularly social surroundings, in fostering certain tendencies rather than others. The older psychology of Locke overlooked the effects of the former. To Locke all men appeared to be born with equal abilities, the differences which subsequently disclose themselves being due to experience and education. Later thinkers, differing widely from Locke in their psychology, appear to hold the same view. Kant said: "Education can make everything out of a man";[1] and Carlyle wrote of "the all but omnipotence of early culture and nurture".

The newer psychology rightly insists on the existence of congenital differences, on the effects of "nature" as distinguished from "nurture". Mr. Galton and others have certainly shown that similar conditions of life and training do not produce in the case of different children *proportionately* similar results. And this is just what our psychological theory leads us to expect. The force of the individual congenital impulse or disposition counts for something even in the case of "average children". I suspect that school children do much more than the teacher is commonly aware in selecting from among the intellectual material which he supplies what is adapted to their individual aptitudes and tastes.

At the same time it is possible that, as a reaction from Locke's teaching, we of to-day are apt to underestimate the effect of surroundings and more particularly of early bringing up. These, though of course they are powerless unless they find something in the child with which

[1] "Die Erziehung macht alles aus dem Menschen." Schopenhauer asserted the exact contrary: "Die Erziehung macht *nichts* aus dem Menschen".

they can come into vital *rapport*, nevertheless help by their action to determine which among the many latent tendencies of the child shall grow into fixed and definite aptitudes, interests, and lines of conduct.

It is sometimes said that men of exceptional ability and character, and more particularly men of genius, are less subject to their surroundings than others, that their natural impulses push forth with such force as to germinate and fructify even *in spite of* unfavourable surroundings. Thus born poets have insisted on becoming poets though their parents were sagely convinced that they ought to be lawyers or merchants, and musicians have found their way to knowledge and renown under the most crushing discouragements. This saying embodies a truth. The stronger the native intellectual or moral bent of a child, the more strenuous his upward aspirative effort, the more independent will he be of his surroundings; or, to put it more accurately, the more powerfully will he react upon his environment by way of choosing what forces shall act upon his development. The gifted child, instead of responding to such environmental influences as happen to play on him, helps to *create his environment* by going in search of congenial scenes, by selecting companions, books, etc. Even here, however, as great men have again and again testified in their published reminiscences, the environment has been necessary, and its particular fashion or character has in many ways determined the directions of early activity.[1]

[1] On the relation of education to the development of genius, see some valuable remarks by Guyau, *Education and Heredity* (English transl.), p. 104 ff.

The question of the comparative strength of the internal and the external factor in individual development seems at present hardly susceptible of solution. As I have said, both factors must combine in every process of early development. It is only later on when the individual becomes strong enough to be independent of his surroundings and to educate himself that development can even seem to advance through the activity of one factor only. It follows that in the early years, at any rate, *development is strictly limited by the range of meeting-places or points of coincidence of the two forces.* Whenever a child's mind advances in knowledge, taste, or virtuous disposition, it is because (1) there is some impulse in himself pushing, so to say, in this direction; (2) there happens to be present in the environment some feature which answers to this impulse, and calls it into some definite form of activity.

Within these broad limits we may speak of a *selective action* on the part of the stronger forces at work. This selective action may be viewed as coming from certain features in the environment, and as specially fostering the growth of particular tendencies in the child. This is the point of view of Locke and of writers on education generally. These assume in the child a multitude of germinal aptitudes, tastes and dispositions from among which the environment, by making certain of its forces powerful and predominant, is able to pick out certain elements raising these to a higher level of development. On the other hand, writers like Mr. Galton and M. Ribot, thinking more of the case of gifted and self-assertive children, conceive of the selection as arising rather from the side of the congenital impulses, some of these being able by their greater force to develop themselves by attracting to themselves, so to speak, the fostering influences of any features in the environment which are fitted to nourish and strengthen them. As I have tried to show, both points of view are justified, and ought to be kept constantly in mind.

Measurement of Intellectual Development. The new and promising work of experimental psychology has begun to concern itself with the problem of estimating more exactly the increase of intellectual capacity with years and a normal amount of exercise. A good example of such systematic investigation is Mr. Gilbert's researches "On the Mental and Physical Development of School Children". (*Studies from the Yale Psychol. Laboratory*, 1894, ii., 40.) These researches, carried out on 1400 school children between the ages of six and seven-

teen, have tested a number of different capacities which will be more fully explained by-and-by, *e.g.*, discriminative sensibility as shown in judging of the weight of objects, of the intensity of light (degree of luminosity), of the visual magnitude of objects (*i.e.*, of objects as seen), and of the pitch of tones ; the quickness of motor responses as illustrated in striking repeatedly on the button of an electric key ; the shortness of reaction-time, and so forth. These researches show that mental capacity in general grows between the ages of six and seventeen —at first quickly, then more slowly. A sudden change appears to occur in general between the ages of thirteen and fifteen. The researches help further to show more precisely how the course of intellectual development varies among children.

BEARING OF THEORY OF DEVELOPMENT ON EDUCATION.

RELATION OF DEVELOPMENT TO EDUCATION. In saying that the full normal development of a child's mind, both on the side of intelligence and on that of feeling and of character, requires the action of the social environment at its best, we virtually say that it requires education. No doubt a child born into an instructed and refined home will derive much benefit from his surroundings even when no methodical discipline of his powers is attempted. Yet such chance disconnected social influences would never secure a *complete* human development. The many-sided harmonious development of a human being, the full maturing of his powers of thought, his capacities of emotion and his moral character, presupposes *a methodical bringing to bear on the unformed mind of all that is best in the social environment, in other words, of education.*

The notion, favored by the sentimental age of Rousseau, that a child would best attain to a beautiful development of his nature if left

as free as possible from the artificial restraints of the teacher, has been corrected by the idea of Kant and Herbart that man becomes man, *i.e.*, attains to the highest realisation of what is distinctively human, only as the result of education. Herbart more particularly has emphasised the point that the process of normal development is not the result of a mere outward movement of the child's inner impulses or activities, which activities are predetermined from the first. He holds that the course of a child's mental development is rather determined by outside influences, by the particular groups of presentations which are supplied in the first years, and so requires a careful selection and arrangement of these by the educator. Herbart here starting from very different psychological principles from those of Locke reaches a conclusion which closely agrees with his.[1]

FOLLOWING NATURE. Assuming it to be allowed that methodical training is necessary, one may still ask what is its precise relation to the processes of "natural development". The influence of Rousseau and others is still recognisable in a good deal of the vaguer sort of writing about education. We are continually told to "follow nature," to make our teaching conform to nature's methods, and so forth. I believe that there is a fallacy lurking in this way of speaking.

To begin with, then, education is an art and not a natural, *i.e.*, a spontaneous and instinctive process.[2] The early education of her child by an intelligent mother is far more than an instinctive process, such as we find in the

[1] See for a brief statement of Herbart's view of the relation of Education to Development, Mr. and Mrs. Felkin's *Introduction to Herbart's Education*, pp. 11, 12.

[2] On the ambiguities of the term nature and its proper meaning when contrasted with human effort and art, see the remarkable essay on "Nature," by J. S. Mill, in his posthumous volume, *Essays on Religion*.

"education" of its offspring by one of the lower animals. The methodical, carefully systematised scheme of education of the school is still further removed from such an instinctive mode of activity. It is essentially a human art, consciously and intelligently aiming at an end, and pursuing this by well-defined methods. It is, moreover, an art which in a peculiar sense is the creation of the community. Education is now recognised as the affair of the nation, which by means of it secures its own efficient preservation and its further progress. It is, further, an art which taxes all the resources of the culture attained by the community. Again, education does not, as seems sometimes to be maintained, follow the natural course of development of a child's mind. Since all development of a child's mind (which is worthy of the name) includes some amount of stimulation and guidance of this mind by others, the "natural course of development" can only mean the effect of such social influences as may chance to act upon it. This being so, one must maintain that the educator has not only to supplement such natural development but to interfere with it and to counteract its movements in this and in that direction. As an art education must rise above and control nature.

What is true in this talk about following nature is that a teacher must understand, and adapt his methods to, unalterable facts and laws. Thus he must study, as we saw above, the common characteristics of childhood, and he must know the permanent laws of mental growth and harmonise his course of procedure to these. In other words, although he aims at something very high above nature, he may be said to take his start from

nature, seeing that he can only act upon a child's mind at all with real educative effect when he understands its proper modes of activity, and the natural order of unfolding of its powers, and adjusts the several parts of his method of training to these.

In the first years the intellectual and moral culture of the home, more particularly the instruction and moral discipline of the mother, constitutes a most important beginning of this educative control of the child's mental development. Later on the continuous and methodical work of the school teacher, though this is more restricted on the emotional and moral side, becomes the great and dominant factor in intellectual progress.

METHODICAL TRAINING OF THE FACULTIES. The systematic character of the teacher's mode of work is implied in the word *training*. This involves the placing of the child in well-selected circumstances, and bringing to bear on its mind and character certain methodical agencies. To train any power of the mind means to exercise it in a careful and suitable manner; secondly, to follow out continuously a graduated series of such exercises. Thus a child's power of observation is trained when pains are taken to supply the best modes of exercise, and to follow these up in a progressive series.

Intelligent training, which adjusts itself to natural laws, will aim directly at calling forth a power into its proper mode of action by supplying the materials, and by arousing the needed moral forces, *viz.*, the feeling of interest and the desire to gain knowledge, which are adapted to the stage of development reached at the time. Training may be said to be adapted when it supplies a perfectly suitable and adequate exercise of a power, without overtaxing it.

A boy's observing powers are not properly trained if the objects presented for examination are too familiar, or if they fail to awaken the requisite interest. Training ought to aim at exercising a power in the best and fullest way permitted by the stage of development reached.

It follows that in good training the forms of exercise should be sufficiently varied to ensure *manysidedness of development*. Thus in training the observing powers attention should be exercised in a variety of ways, on colours as well as forms, and so forth. By excessive exercise of a power is meant a forcing of its activity beyond the point most favourable to growth. Training must be progressive, the tasks becoming more complex and difficult as the learner's ability improves.

In this connection it may be well to repeat that the best and most intelligent training is that which directs itself to what is *most essential and central*, so to say, in a mental process. Thus a good teacher in carrying out an object lesson will keep in view the importance of carefully discriminating the several parts, as also the several qualities, of the object, and of assimilating what is now seen to what has been seen previously.[1]

TRAINING TO FOLLOW THE NATURAL ORDER OF DEVELOPMENT OF THE FACULTIES. As implied in what has been said in the preceding paragraphs, the educator in training the several " faculties " must conform to the natural or predetermined order of development of these. One of the really definite and valuable products of modern educational thought is that it is vain for the teacher to " rush " a child into the thicket of grammatical and other abstractions; that the training of the intelligence must

[1] Compare above, p. 47 f.

begin with a methodical and complete exercise of the senses and powers of observation; that the time devoted to this fundamental part of school work is more than saved by the gain in intellectual material thus stored up, which makes all the processes of ideation and thought more rapid, and their results more complete and valuable.

As we have seen, the process of intellectual development is one connected whole, and consequently the training and educational formation of the earlier "faculties," observation and memory, prepares for that of the higher powers of thought. At the same time the teacher must not suppose that by exercising the lower forms of intellectual activity he is doing the same thing as by exercising the child's mind in thinking about more abstract subjects, such as number and form. He should take care to move on, as the processes of development permit, to the training of the higher powers. To know exactly when to begin the more difficult exercises of thought implies, as will be explained more fully by-and-by, careful child-study, both general and individual.

Each branch of training should not only be begun as soon as possible, but should be continued with progressive increase of difficulty *up to the required level of perfection.* This expression points to *a gradation of values.* It is important to bear in mind that the development of a fine sense-capacity and even the production of accurate observing powers, though of considerable importance, are chiefly of *intellectual* value as laying the foundations of the higher activities of intelligence. We may easily keep a child too long at exercises in observation, just as we may easily keep him too long at memory-work, forgetting that both alike are preparatory for what is

highest and best in human intelligence, the power of arranging our concrete facts, of thinking out their general aspects, their mutual relations, and their governing laws.

The perfect following out of this principle of proportionate training leads to that harmonious development of all the powers of the mind on which Pestalozzi and others have laid emphasis. In order to determine wherein such a complete and harmonious development consists, one must, it is evident, have clear ideas about the human being in his ideal completeness. We must understand not only how in this ideal organism the lower forms of intellectual activity play a subordinate part, but how intellectual culture as a whole ranks in value in relation to moral education (compare above, p. 56).

NO ISOLATED TRAINING OF A FACULTY. While I have thus dealt with the teacher's work as though it could be broken up into portions corresponding to the several intellectual and other powers of the child's mind, I would warn my readers against the danger which lurks in all such language. Properly speaking, the mind is at no time wholly engaged in one variety of activity. A child, as soon as he becomes intelligent at all, will begin when observing an object to exercise *at the same moment* his memory and the germ of his thinking powers, as, for example, in saying that this tiger in the cage is like pussy, and must be very old. What we call intelligence is at once observation, memory and thought: it is a whole organised group of processes. The educator who clearly seizes this truth will see that while in particular lessons he may rightly make his primary and chief aim the training now of observation, now of imagination, he must in every case appeal to the child's intelligence as

a whole, encouraging him to remember and to compare while he observes, and to reason while he remembers or imagines. Since, moreover, as we have seen, to exercise a child's intellect implies an appeal to his feelings and an arousing of his will, we may say that *all good instruction involves a training of the whole mind.*

Finally, training in order to be adequate must be to some extent elastic, adapting itself to the numerous well-marked differences among young minds. Up to a certain point a common result, namely, a typical completeness of mental development, will be aimed at. It would not be well for example that any child, however unimaginative naturally, should have his imagination wholly untrained. To omit to train a power because it seems to be defective would be a great blunder, if only for the reason that we can never know whether a power is defective in a child until we have followed out a careful course of exercise. Hence the evil of the too early specialisation of study so often seen in schools, especially those which aim at training for scholarships. At the same time it is certain that this typical plan of cultivation will have to be modified in detail. The educator does well to bear in mind that the stronger the natural germ the more economical the production of a perfected aptitude. Hence it would be wasteful to give as much time and thought to the cultivation of a poor natural ability in a child, say for languages, as of another ability, say for natural science, which is decidedly good. Nor do the practical ends of life impose such a disagreeable task on the teacher. Variety of individual development has, as we shall see later on, a high *social* value.

SUPPLEMENT TO CHAPTER V.

PERIODS OF DEVELOPMENT.

WHILE mental development is one continuous process, it has its landmarks or turning-points which divide it into *periods*, these being marked off one from another by certain dominant characteristics, physical and psychical. A careful sketch of each of these periods, with the characteristic changes which distinguish it from preceding stages, would supply a valuable addition to the theory of mental development, more particularly in its bearing on education.

A number of writers on education have adopted this mode of tracing the complex movements of mental growth. Thus Beneke distinguishes four periods: (1) *to about the end of the third year*, in which the consciousness of self and not-self gradually unfolds, and which is characterised by the predominance of the outer sense-life, including instinct; (2) *to about the end of the seventh year*, in which the inner mental activity (representation) gradually develops itself to the point of equilibrium with the receptive functions of sense, and instinctive impulse gradually gives place to conscious design; (3) *to about the end of the fourteenth year*, in which the inner self-activity becomes free from sense and acquires preponderance, first and chiefly as imaginative activity, then as a tendency to abstract reflection or thought; (4) *to the close of school-life*, in which the higher mental powers are more fully developed, and which forms a transition to the period of independent intellectual and moral activity.

A more careful and elaborate division of the mental life into periods is attempted by Pfisterer. (1) According to this the first period is marked off as the *suckling age* (to end of first

year), in which the bodily life and sense are in the ascendant, and instinct takes the place of will. (2) Next comes *the age of childhood* (from the second to the seventh year), which is regarded as the beginning of the school period. Here there manifests itself a germ of self-consciousness, though the outer world is still engrossing. Curiosity shows itself in its lowest form as a desire for novelty. Memory and imagination are active, and the rudimentary stage of abstract thought or conception is reached. Activity is abundant under the form of free, aimless play. The disposition to respect authority and to form habits of obedience now shows itself, assuming, towards the close of the period, something of the aspect of a willing reflective submission to moral rules. Feeling now loses something of its first violence, and is being organised into permanent dispositions (Stimmungen). (3) After this follows *the period of boyhood and girlhood* (from the seventh to about the fourteenth year). This constitutes the age of elementary school instruction. It is marked by a clearer exhibition of individual peculiarities. The intellectual processes gain in steadiness under the control of a stronger will-power. Hence there becomes possible the more orderly constructive activity involved in learning, as well as the methodical formation of abstract ideas. A growing habit of self-control now asserts itself. The progress of intellectual and volitional capacity leads to the development of independent judgment, free choice, and self-reliance. Finally, this period is characterised by the development of new feelings, *viz.*, the social, intellectual and æsthetic sentiments. (4) *The period of youth* (forming the interval between the school period and manhood, and supplying the transition to perfect independence and self-reliance in thought, feeling and action) is only briefly glanced at.[1]

[1] A similar but more elaborate division of stages of development is given by B. Hartmann, in the article "Alterstypen," Rein's *Encyclop. Handbuch der Pädagogik*.

It is evident that in thus trying to mark off periods of development reference should be made to *great and decisive physiological changes*. Of these the first is the well-marked termination of the helplessness of infancy (early in the second year) by the development of the muscular system, which results in locomotion (walking). This development of the power of locomotion brings a vast extension of the field of observation and knowledge, as well as of that of voluntary action. This epoch is further defined by the introduction at its close of the beginnings of the all-important function of *speech*. Another date, hardly less epoch-making, is the attainment of puberty, a point of development in which certain physical changes, bringing with them new instincts, are apt to affect profoundly both the intensity and the range of the emotional life as a whole, and along with this to exert a marked influence on the directions of intellectual activity and of conduct.[1]

REFERENCES FOR READING.

For a fuller account of the processes of mental development the reader may consult the following: Herbert Spencer, *Principles of Psychology*, vol. ii., part viii.; Romanes, *Mental Evolution in Man*, chap. xi.

On the modern doctrine of Heredity and the bearings of the theory of Evolution on mental development in the individual, the following will be found useful: Th. Ribot, *Heredity;* J. M. Guyau, *Education and Heredity;* Lloyd Morgan, *Habit and Instinct* (especially chap. xv.).

For the readers of German there are also the articles in Rein's *Encyclop. Handbuch der Pädagogik*, "Alterstypen," "Begabung-anlagen," and "Evolutionismus und Pädagogik".

The bearings of the theory of development on Education are treated

[1] According to Sir J. Crichton Browne, the course of physical development can be divided into periods of seven years by help of the following epochal changes: (1) primary dentition (first year); (2) secondary dentition (seventh year); (3) puberty (fourteenth year); and (4) maturity (? addition of wisdom teeth) (twenty-first year). See *Book of Health*, p. 319 and following.

of by Herbert Spencer, *Education*, chap. ii. (with which should be read W. H. Payne, *Contributions to the Science of Education*, chap. iv.); Lloyd Morgan, *Psychology for Teachers*, chap. vii.; and Guyau, *Education and Heredity*, especially chaps. ii., iii., and vii.; in French, among others, by Henri Marion, *Leçons de Psychologie*, sixième to huitième; and, in German, by Beneke, *Erziehungs und Unterrichtslehre* i., p. 101 ff.; Waitz, *Allgem. Pæd.*, §§ 4 and 6; Dittcs, *Grundriss der Pädagog.*, §§ 22-24; Pfisterer, *Pädagog. Psychologie*, § 2; and Gustav Lindner, *Grundriss der Pädagog. als Wissenschaft* (*cf.* the article "Evolutionismus und Pädagogik" in Rein's *Encyclop. Handbuch*).

PART II.

DEVELOPMENT OF INTELLECT.

CHAPTER VI.

PSYCHICAL ELEMENTS: SENSATIONS, ETC.

We shall now proceed to trace more in detail the processes by which the several functional activities of the mind develop, and as a result of this the whole mental life gradually takes on its rich complexity.

Here we must, it is evident, set out with the elements which are necessary for the formation of the several products which our mental life discloses. These are *given* to us at the outset, being secured by certain congenital arrangements of the nervous system. Such elements are the sensations of hunger, taste, smell, etc., which involve no productive activity of the mind itself, but arise as soon as certain nervous processes occur. Having briefly reviewed these elements, we shall examine the mental activities which serve to elaborate them into such mental products as perceptions, ideas, and so forth.

In following out these processes of mental growth, we shall at first be occupied with those of intellectual development, since, as pointed out above, there are certain conveniences in studying these before the processes which constitute the development of feeling and of conation.

(A) THE SENSES AND SENSATIONS.

It is evident that in order to understand how a child comes to know things, we must examine the function of the senses; for all knowledge of objects, their properties and their laws, depends on the use of these. They supply the material which, when acted on by the functional activities of mind, takes on the shape of what we call a cognition.[1]

This function of the senses in cognition is particularly manifest in early life: "Our first teachers of philosophy," says Rousseau, "are our feet, our hands, our eyes". They are necessary, however, for the later as well as for the earlier processes of intelligence. An examination of our most abstract notions respecting the physical world, such as force and geometrical figure, leads us back to these impressions of sense. Our ideas respecting the nature and properties of things are limited by our sensations. The want of a sense, as in the case of one born blind, means the deprivation of the mind of a whole order of ideas. The addition of a new sense, if such a thing were possible, would enrich the mind by a new kind of knowledge respecting the world.[2]

Sense-Materials or Sensations. The senses furnish us with certain materials which are variously called

[1] This is a different idea of their use from that set forth in the oft-quoted saying of the mediæval schoolmen: "Nothing is in the intellect which was not previously in the senses". As we shall see, intellect is not a receptacle into which the senses can discharge their "impressions": it is a group of activities by which sense-impressions are transformed into those new products which we call cognitions.

[2] Condillac, an ingenious writer of the last century, tried to show how the successive addition of the senses of touch, sight, etc., would enlarge the mental life of an imaginary statue.

"impressions," "sense-impressions," etc. The most comprehensive general name for these is Sensation. Thus the proper function of the sense of touch is to supply sensations of pressure. Taking sensation to be the intellectual material supplied by a sense, we have to view it as something perfectly simple and original. A bitter taste, a soft touch, are changes in our consciousness which we cannot derive from anything simpler: we can only say that they are *given* to us. We can only account for them by saying that they are due to the activity of a sense-organ. We may then define a sensation as *a simple mental state resulting from the stimulation of the outer extremity of an "incarrying" nerve, when this stimulation has been transmitted to the higher brain-centres* or "psychical centres" (compare above, p. 32). Thus the stimulation of a point of the skin, *e.g.*, by pressing or rubbing, is said to be the exciting cause of a sensation of touch.

It must, however, be carefully understood that we never experience perfectly simple sensations. For one thing, the stimulation of our organs of sense rarely if ever gives us a single sensation. For example, in taking into the hand a glass we have a number of sensations of pressure and temperature by which we know that it is cold, smooth, hard, etc. What is still more important, the simplest conceivable experience is made up of sensations as just defined, and something more, *viz.*, mind-activity. Thus, as we shall see, a child does not hear sounds till it begins to single out from the confusion of aural "sentience" first presented, particular elements, *attending* especially to these, and so *discriminating* them. Hence it would be well to describe the function

of a sense as the supplying of sense-materials, rather than of well-defined sensations.

These sensations or sense-materials have two broadly distinguishable aspects, one of which is commonly predominant. The first is the affective or *emotional* aspect, by which is meant the presence of a distinct feeling-tone, pleasurable or painful. A sensation of bodily warmth or of sweet taste illustrates this prominence of the feeling-aspect. The second aspect is the *intellectual* or knowledge-giving. By this is meant the presentation in the sense-material of definite and clearly distinguishable properties which, when they come to be attended to and recognised, may be called marks or "characters" because they serve as clues to the qualities of external things. They may be best spoken of as *presentative characters*. The definite variety of sensation experienced on touching a smooth surface, or on hearing a sound of a particular pitch and loudness, is an example of the predominance of such presentative characters.

General and Special Sensibility. All parts of the organism which are supplied with sensory nerves, and whose functioning consequently gives rise to sensations, are said to possess Sensibility of some kind. But this property appears under one of two very unlike forms. The first of these is common to all sensitive parts of the organism, and involves no special structure at the outer extremity of the nerve. The second is confined to certain parts of the bodily surface, and implies special terminal structures or "end-organs," such as the curious nerve-terminations in the skin and in the retina of the eye. To the former is given the name Common or General Sensibility, and also

Organic Sense; to the latter, Special Sensibility, or Special Sense.

The sensations falling under the head of Common Sensibility or the Organic Sense are marked by the absence of definite characters. They are vague and ill-defined. Their distinguishing peculiarity is that they have a marked pleasurable or painful aspect. Such are the feelings of comfort and discomfort connected with variations in the processes of digestion, in those of the circulation of the blood and attendant thermal changes, and so forth. These sensations are not, like those of touch or sight, directly connected with *the action of external stimuli*, but arise from *a changed condition of the part of the organism concerned.* As such they give us no knowledge of the external world. They are no doubt important as informing us of the condition of the organism itself; but owing to the vagueness of their presentative characters they give us very little *definite* knowledge even of this.

The sensations of Special Sense are those we receive by way of the five senses. They are marked off one from another by great definiteness of presentative character. This peculiarity is connected with the fact that each sense has its own specially modified structure or "end-organ" —*e.g.*, the nerve-appendages of the eye and of the ear— which is fitted to be acted upon by one particular kind of stimulus (light-vibrations, air-waves, etc.). Owing to this definiteness of character the special sensations are much more susceptible of being discriminated and recognised than the organic sensations. Moreover, these sensations are (in ordinary cases) brought about by the action of *external* stimuli or agents exterior to the

organism, and are on that account commonly described as "impressions," or as "sense-impressions".[1] For these reasons they are fitted to yield us knowledge of our environment.

Presentative Characters of Sensations. The two most important distinctions of presentative character which run through our several varieties of sensations are those of Degree or, as it is better named, Intensity, and of Kind or Quality.

The "intensity" of a sensation refers to a difference of *quantity*. It is illustrated in the difference between the impressions due to a bright and a faint light, to a loud and a soft sound, to a gentle and hard pressure on the skin. As our way of speaking about it necessarily implies, the intensity of a sensation rises and falls with the strength or force of the stimulus.[2] All classes of sensation exhibit such differences of intensity. They are of great importance for knowledge. Thus the degree of pressure which a heavy body, such as a leaden ball, exerts on the hand helps to tell us of its weight.

A difference of Kind or of *Quality* is illustrated in the difference between sensations of sour and sweet, of blue and red. The peculiar quality of a sensation, as that produced by a blue colour, is supposed to be connected with the *form* of the nervous process involved.

[1] The sense-impression which we are here concerned with, *e.g.*, the sensation of being pricked, is a *mental* phenomenon, and must be carefully distinguished from the *physical* "impression," *e.g.*, the dent or puncture in the skin.

[2] The exact way in which intensity of sensation rises with strength of stimulus is set forth by Weber's Law. See W. James, *Psychology*, p. 17 ff.

It is known that blue rays of light have a different rate of vibration from other rays, and it is probable from this that they produce a different kind of effect on the optic fibres. All sensations have distinctions of quality: the difference between a touch and a taste is one of quality. These qualitative peculiarities of our sensations, again, are presentative characters, which serve as marks of external facts. Thus we distinguish flowers in part by their differences of colour, voices of men and women by their differences of pitch and "timbre".

THE FIVE SENSES. Coming now to the senses in detail we see that they do not all exhibit the same degree of definiteness or the same number of distinct presentative characters. We usually speak of Taste and Smell as the coarse or unrefined senses, whereas Hearing and Sight are described as the refined ones. By attending simply to the degree of refinement we may arrange the senses in the following ascending order, Taste, Smell, Touch, Hearing, Sight. A few words on the special function of each must suffice here.[1]

TASTE AND SMELL. These two senses present a decidedly low degree of refinement. Indeed the sensations of these senses may be said to approach the organic sensations in want of definiteness, and in the predominance of the element of feeling (pleasure and pain). These peculiarities are connected with the fact that these senses have as their function the announcement of what is wholesome or unwholesome to the organism as a whole. The very situation of the organs

[1] Here, again, I have to assume some elementary knowledge of physiology, *viz.*, the part which describes the structure and function of the sense-organs.

at the entrance of the digestive and respiratory cavities suggests that they are sentinels to warn us as to what is good or ill. The sensations of taste and smell tend to be confused one with another, and they cannot be distinguished either in intensity or quality as finely as those, say, of light or sound. For this and other reasons they are of comparatively little importance as knowledge-giving senses. It is only under special circumstances, as those of the chemist, the wine-taster and so on, that these "servants of the body" supply a considerable quantity of exact knowledge about the properties of external objects.

Touch. The sensations of touch are brought about through the action of some external object on the end-organs of the nerves of touch, which organs are situated in the skin. They commonly include both sensations of pressure and those of temperature.

These tactile sensations supply important elements of feeling.[1] Thus contact with smooth surfaces and with warm, soft bodies is, as we know, one chief source of sensuous pleasure, especially in early life.

The chief importance of touch resides, however, in its intellectual aspect. In its highest degree of development, as it presents itself at definite portions of the bodily surface, more particularly the hands, and pre-eminently the finger-tips, the tactile sensibility becomes a most important means of ascertaining the properties of bodies. The sensations of touch have a much higher degree of definiteness of presentative character than those of taste or of smell.

[1] The student should notice here the ambiguity of the word "feeling". All touching is "feeling" in one sense: the word in the text refers of course to the pleasure-pain aspects of touch-sensations.

The discrimination of degrees of intensity by the tactile sense is estimated by laying a weight on the hand, or some other part, and then trying how much must be taken away or added in order that a difference may be just perceived. This measures what is known as the *Discriminative Sensibility to Pressure.* It is found that this sensibility varies considerably in different regions of the bodily surface. For instance, on the anterior surface of the fingers the smallest difference of pressure detected is only about one-half of that recognised on their posterior surface. That is to say, we have about twice as much discriminative sensibility to pressure on the front surface as on the back surface of the fingers.[1]

This discrimination of degrees of pressure by the skin is one of the means by which we obtain knowledge of the force exerted by bodies, *e.g.*, the difference of weight when a heavy or a light body presses on the hand or the foot.

In the case of touch we have a further difference of sensation which, as we shall see, is of very great importance. If a small coin is laid on the palm of the hand, and then a second, which, though having no more weight than the first, covers a larger area of the skin, we can by the sense of touch alone say that the second is larger. This property of more or less "spread" in our sensation of touch has been called volume, or, better, *extensity*. It appears to have as its physiological ground

[1] In speaking in this chapter of discriminative sensibility and of discrimination, I am referring merely to the *possible differences* of intensity, etc., which the structure of our sense-organs allows of. As already pointed out, the *realisation* of these differences, or discrimination proper, involves the co-operation of mind with sense.

the stimulation of a smaller or greater number of nerve-fibres.

Closely connected with this extensity of tactile sensation is another property. If a person is blindfolded, and then has his hand lightly touched, say, by the points of a pair of compasses, he will, provided that these do not come very near one another, be aware of two touches. This has been called "plurality of points". It may be better designated as *the local distinctness of our touch-sensations*, or *local discrimination of touch-sensations.* This local discrimination, like the discrimination of pressure, varies considerably at different parts of the bodily surface. It is much finer in the mobile parts of the body (fingers, tongue, lips, etc.) than in the comparatively fixed parts (the trunk). It decreases rapidly as we go from the extremities, as the finger-tips, towards the trunk. It is finer, too, on the anterior surface or palm side of the hands than on the posterior. We see from this that the anterior surfaces of the finger-tips are specially marked out *as the organ of tactile sensibility.*[1]

These two properties of touch, extensity and local distinctness, are of the greatest consequence for knowledge. It is by means of these that we get to know about what is called "extension," *i.e.*, the shape or figure and the size of an object, also the distance between one object and another when they simultaneously touch us. Thus,

[1] The tip of the tongue, which has even more local discrimination than the finger-tips, is very constantly employed as a touch-organ in exploring the mouth. A fuller account of Weber's celebrated experiments, on which these results are based, can be found in W. James, *Psychology*, chap. v., p. 62.

in laying my hand on a small book-cover, I at once know something of its shape and size, and the distance of one angle from the other, because I am able to estimate the "spread" or extensity of the touch, also to distinguish the touch at one part of the hand from that at another. Further, the local discrimination takes part when we touch a rough surface, as that of sandpaper, distinguishing the little projections.

Finally, under touch there is commonly included the sense of temperature or *the thermal sense.* It is now known that this sensibility is connected with special nerve-structures distinct from those of the tactile sense proper, and not varying in the same way as this varies at different portions of the bodily surface. Hence we are justified in speaking of the thermal sense as a separate sense. It is further known that certain very small areas of the skin are specially sensitive to the contact of hot bodies and not to cold, others sensitive to cold and not to hot. At the same time, the sense of temperature works in close connection with touch proper. The child learns to know a metal and to distinguish it from wood by touching it, and so finding out not merely its smoothness but also its coldness.

Passive and Active Touch. So far we have considered touch merely as a passive sense, *i.e.*, as sensibility to the action of things on the tactile surface. But the fact that we speak of ourselves as touching things shows that it is an active sense as well. In touching an object we ourselves bring the organ into contact with it, and so secure an exercise of the sense. Such active or self-initiated touch is effected by means of certain muscles, more particularly those by which the arm is

moved as a whole and in its several parts. This bringing into play of our voluntary muscles [1] is a matter of very great importance as enlarging the range of our experience and knowledge.

The first and most obvious advantage of this addition of muscular activity is the multiplication of our tactile impressions. Just as the mobility of the insect's antennæ enables it to gain many more impressions of touch than it would have if the organs were fixed, so the mobile arm, hand and fingers of the child greatly extend the range of his tactile experiences. By such movements he is able to bring one of the most sensitive parts of the organ (the tips of the fingers) into contact with a great number of objects, and, further, to gain impressions of this and that object in rapid succession, so as to discriminate them better one from the other.

This widening and perfecting of passive impressions is however only one part of the gain resulting from the high degree of mobility of the hand. Another and no less important part is the new experience which accompanies these movements, and which constitutes a distinct and very important source of knowledge. This experience is supplied us by what is now commonly known as the *muscular sense.*

Muscular Sense. This expression marks off the sense-material which comes to us immediately in connection with our (voluntary) muscular activity. It has to be distinguished from the *indirect* results of this activity, such as the sensation of contact resulting on a

[1] "Voluntary" muscles are those which can be controlled by our volitions, as those of our limbs; "involuntary," those which cannot be so controlled, as those of the heart.

movement of the arm towards an object, or the sensation of sound following the action of the vocal muscles. The experience, common in drill exercises, of reaching forward with the upper part of the body and thrusting the right arm outward as far as possible is a good illustration of muscular sensations. These sensations, like the passive ones, have certain presentative characters of their own. They constitute *active states* in a peculiar and pre-eminent sense. In singing, in moving the arm or leg, in pushing a heavy body, we have a sense of bodily activity, or of exerting muscular energy.

The muscular sense is important both as a source of pleasure and as a means of knowledge. The child delights to exercise his muscles, to realise his bodily power. Certain modes of muscular exercise, such as rapid rhythmical movements, are known to be exhilarating, while others, such as slow rocking movements, are soothing. It is, however, chiefly as a source of knowledge that we shall now regard this sense.

The sensations which accompany muscular action may be conveniently divided into two main varieties. The first are (*a*) sensations of movement or *motor sensations*. They are illustrated in the experience of moving an arm or a leg in empty space. The second are best described as (*b*) sensations of strain or of *resistance*. They occur where the impulse to move a limb or the whole body is obstructed or impeded. They are exemplified in the experience (other than that of the tactile sensations of pressure themselves) which accompanies the act of pushing against a heavy object, or lifting a considerable weight with the hand, and which would be commonly described as a sense of strain.

(*a*) Sensations of movement present two well-marked differences of quality. (1) In the first place, they vary in character *according to the direction of the movement.* Thus the sense-material given in bending the right arm is qualitatively different from that given in straightening it. And it is this difference in the motor sensations which enables us to ascertain what is the particular direction of any movement which we are executing. (2) In the second place, these sensations vary in character according to the *velocity* of the movement. The experience of bending the right arm quickly differs from that of bending it slowly. And we are able to distinguish many degrees in the velocity of our movements.

(*b*) The sensations of strain, as when we push with the shoulder or arms against a heavy body, drag it after us, or lift it, have a distinct character of their own. They exhibit, like those of movement, many distinctions of intensity. We experience different sensations in lifting a pound and a pound and a half.

Each of these modes of muscular experience constitutes an important auxiliary source of knowledge in connection with touch. Indeed, our information respecting the most fundamental properties of material things would be very vague and rudimentary but for the addition of the muscular sense.

In the first place, it is the sensations of strain which give the child an immediate knowledge of the most fundamental and characteristic property of material bodies, *viz.*, what is known as resistance, under its various modes, as hardness, density, rigidity. The sense of pressure gained by way of an immobile organ, say a paralysed

limb, could never in itself supply any distinct knowledge of this property. It is only when we muscularly react on things, and find them resisting our efforts, that we come to know them as material realities. Our common way of estimating the degree of hardness or density of a substance is by the aid of muscular discrimination. Further, the discrimination of weight, though this is possible to a certain extent by way of passive touch, is much more accurate when the muscular sense is called in to help. If a person wants to estimate a weight nicely, as in ascertaining the weight of a letter when no scales are at hand, he lifts it and judges of the weight by means of the intensity of the muscular sensations involved.

In the second place, it is by help of our motor sensations that each of us acquires a knowledge of the extendedness of things, of the relative position of points, and of the shape and size of objects. The rudimentary and vague knowledge which might be obtainable by means of the local discrimination of the skin needs to be rendered distinct and exact by means of varied and repeated movement. Thus, both the shape and the size of a small object, as a ring or cross, are made much clearer to us when we pass the finger-tip along or round it, and so judge of its form and dimensions by the direction and length of the movements carried out, than when it is laid on our passive hand. The blind habitually examine the form of an object by the aid of movement.

HEARING. The Sense of Hearing ranks high both as a source of pleasure and as an intellectual or knowledge-giving sense. The sensations which form the material of music, those of pitch, together with their combinations in

rhythmic melody or tune, are among the most agreeable of our sense-experiences. But the refined pleasures of music presuppose the discrimination of the several tones. The intellectual value of hearing is due to the high degree of definiteness of its distinguishable sensations.

To begin with, this sense gives us an extensive *scale of intensity* of sensation. A trained ear can detect many fine distinctions of loud and soft in musical sounds.

The intellectual character of hearing shows itself still more conspicuously in *the qualitative differences* among sensations of sound. We have here, to begin with, the broad contrast between musical and non-musical sounds or *noises*. The former depend on regularly recurring or periodic vibrations of the air, the latter on irregularly recurring or non-periodic vibrations. In the case of musical sounds we have the remarkable phenomenon of a *scale of quality*. In passing from a low note to a higher one we experience a continuous variation of sensation which is known as that of *pitch*. These differences of pitch answer to changes in the rate of vibration of the atmospheric medium ; the higher the note the more rapid are the vibrations. Our musical scale is made up of discrete tones, separated one from another by perceptible intervals of pitch.

Along with this scale of pitch-quality, there are the differences known as timbre.[1] These are the qualitative differences in sensations of tone answering to differences in the instrument, such as the piano, the violin, the human voice.

[1] This is sometimes called "musical quality" ; but the French name is better. The Germans use the word "clang tint" (Klangfarbe).

In addition to this wide range of musical sensation, the ear is capable of distinguishing a great variety of non-musical sounds or *noises*, as for example the roar of the sea, the rustling of leaves, the crack of a whip. We distinguish noises as jarring, grating, explosive, and so on. It is this side of hearing which is of especial value for the knowledge of external things. A child learns to recognise objects by the characteristic sounds which they produce, such as those of wood and stone when struck, of running water, of a trotting horse.

Finally, there are what are known as *articulate sounds*, those which constitute the elements of speech. These differ from one another partly in point of musical quality; thus it has been recently ascertained that the differences between the several vowel sounds are analogous to those between the tones of the several musical instruments. On the other hand, the differences of consonantal sounds are non-musical in character; in the ordinary classification of these into the gutturals, sibilants, and so forth, we find differences analogous to those among noises.

Enough has been said to illustrate the high degree of refinement which characterises the sense of hearing. The delicate and far-reaching discrimination of quality, aided by the fine discrimination of intensity, enables the ear to acquire a good deal of exact information, as well as to gain a considerable amount of refined pleasure. The delight of music sums up the chief part of the latter. The former is illustrated in that wide range of knowledge which we all acquire by way of our system of articulate sounds, or language.

As a set-off against these advantages, we see that hearing has very little local discrimination. We cannot

distinguish two simultaneous sounds with any nicety according to the locality of their external source, as we can distinguish two touches. Nor is the organ of hearing endowed with mobility, as is the hand. Hence hearing gives us no direct knowledge of the most important properties of objects, their size and shape.

SIGHT. The sense of Sight is by common consent allowed the first place in the scale of refinement. This pre-eminence is suggested by the delicate and intricate structure of the organ, and the subtle nature of the stimulus (ether-vibrations). The eye surpasses all other sense-organs both in the range and in the delicacy of its impressions. These are at once the source of some of the purest and the most refined enjoyment, the pleasures of light, colour and visible form, and of some of the most valuable portions of our knowledge.

In the first place, the eye is highly discriminative of *intensity*. It supplies us with a wide range of luminous impressions, from those of the brightest objects we can bear to look at to those of the darkest which we are just able to make out. The fineness of this discrimination of intensity is of the greatest importance to us in the visual discernment of objects.

In sight, again, we have numerous and fine differences of *quality*. Of these the most important are colour-differences. The impressions of colour, like those of pitch, fall into a series of gradual changes. Passing from one extremity of the spectrum (or rainbow) to another the eye experiences a series of perfectly gradual transitions. These changes fall into the series, violet, blue, green, yellow, orange and red, together with certain finer distinctions, as indigo blue, and greenish blue. It

is known that differences of quality depend (as in the case of pitch-sensations) on changes in the rapidity of the vibrations of the stimulus, *viz.*, the rays of light. The rays at the violet end have more rapid vibrations than those at the red end. These colour-impressions, while they supply an important element of æsthetic pleasure, are also of great intellectual importance. The child learns to know objects, such as his mother, his toys, flowers and so forth, partly by means of their colours.

In addition to these differences of intensity and quality in the sensations of sight we have in the case of this sense, as in that of touch, two endowments which furnish the basis of a perception of space-relations, including the form and the magnitude of objects. The first of these is *the local distinctness of the visual impressions* answering to the stimulation of different points of the retina. Owing to this endowment we can distinguish two points of light, say two stars, even when they lie very near one another. This local discrimination is finest in the central region of the retina known as the yellow spot, which is the area of perfect vision. It is just because we are able to keep the impressions corresponding to distinct retinal points clearly distinct from one another that we are in a position to distinguish at a glance a number of details of form, such as the several letters of a word, and even the several parts of a letter.

Valuable, however, as is this capability of discriminating points, it needs to be supplemented by the muscular activity of the eye. The organ of sight is supplied with a system of muscles by means of which it is able to carry out a large variety of delicate and precise movements. Sight is thus, like touch, an *active*

sense. One result of this activity, as in the case of touch, is to allow of the most sensitive parts of the organ being brought to bear on the particular object or portion of an object which we wish to examine. In fixing the eye on a particular point in the field of vision, say a certain star, we are obtaining a retinal image of it on the area of perfect vision. Another result of this activity is that in the act of moving the eye from point to point of the field we bring the muscular sense into play and thus gain a much clearer impression of the relative position of the several objects in the field, and of the form and the magnitude of these objects. It is by tracing the path of a line with the eye that we can best appreciate its perfect straightness, or the exact degree of its curvature. In early life, more particularly, this is the customary mode of acquiring knowledge of form.

Another muscular endowment of the eye needs to be noted. When we fix the organ on an object at a particular distance, special muscular actions have to be carried out to enable us to see this object clearly. First of all, in looking at a near object, the eye has to carry out a process of *accommodation*, the lens being made to bulge out more in front so that the "optical image" may fall exactly on the retina. The muscular sensations which accompany this adjustment of the eye for any particular distance are one means by which we come to know that the object looked at is situated at this distance. Secondly, it is necessary, in order that we may see clearly when we use both eyes, that the image of an object should fall on the yellow spot in each of the two retinas: hence we involuntarily make the "axes of vision" [1]

[1] The axis of vision is an imaginary line drawn from the point of the object specially "fixed" through the eye-ball to the yellow spot.

converge more when looking at an object near us than when looking at one farther off. The peculiar muscular sensations accompanying the several degrees of convergence, and known as *sensations of convergence*, serve as a much more exact means of knowledge than those of accommodation, respecting the distance of an object that we are looking at.

(B) AFFECTIVE ELEMENTS.

In close connection with the elements of sensation just reviewed there are given at the outset, and as the consequence of the congenital formation of a child's nervous system, certain simple modes of *feeling* (pleasure and pain). Thus in the case of the organic sensations arising from changes in the organs of digestion, etc., there are well-marked feeling-accompaniments. The discomforts of hunger and thirst, of impeded digestion, of bodily cold, are examples of such organic feelings. The sensations of the special senses, too, have their feeling-tone. The contact of rough and smooth in the region of touch is in part a difference of feeling-tone, roughness being disagreeable, smoothness agreeable. These sense-feelings will be considered more fully later on when we take up the development of the life of feeling.

(C) CONATIVE ELEMENTS: PRIMITIVE MOVEMENTS.

Just as there are certain predetermined elements of the intellectual and affective life, so there are certain simple *active* phenomena which appear at an early date, and are known to be the result of congenital nervous arrangements. Every observer of an infant knows that in the first weeks it is not only the subject of sensations

and feelings of pleasure and pain, but reacts upon these sensations and feelings by way of muscular movements. Some of these movements carried out by the so-called non-voluntary muscles do not affect the conscious life. Such are the movements which subserve the vital processes, those of the heart and blood-vessels, of the digestive organs, and so forth. On the other hand, there are certain movements, involving the "voluntary muscles," which are not merely physiological but also psychical processes. The aimless movements of a child's limbs during the first weeks give rise to certain motor sensations, and so affect its consciousness. Hence they contribute true psychical elements just like the stimulation of the sense-organs. All these "primitive movements," as they are called, are "non-voluntary," that is to say, they are wanting in the presence of a conscious representation of some end, or, as we may call it, a *psychical purpose*.[1] At the same time they are conative phenomena partly because they involve, to some extent at least, the element of active impulse, and because by supplying the child with the first experience of his own powers of movement and what results from their exercise they form an essential step in the development of voluntary action, properly so called.

Of these primitive motor phenomena the first deserving notice are known as *Reflex Movements*. They are movements which are excited by the stimulation of a sensory

[1] Actions may be "purposive" in a biological sense, that is, may conduce to the good of the organism, without being determined by a *conscious* or *psychical purpose*. The instinctive action of a hen in incubation subserves Nature's purpose, the preservation of the species, but the hen does not knowingly aim at this purpose.

nerve; the incoming sensory process passing over into an outgoing motor process, and so being bent back or "reflected". Swallowing an object when it reaches the back of the mouth is a reflex movement: contact of the food with the membrane covering this region stimulates the sensory nerves terminating there, and so calls forth the reflex muscular action. Another example is the action of closing the fingers around a small object, such as the nurse's finger, when this is placed on the palm of the hand, an action which can be called forth soon after birth. Other reflexes, such as blinking when an object is suddenly brought near the eyes, occur later. Reflex movements follow so rapidly upon the sensory stimulation that the sensation corresponding to this stimulation is not fully developed. In starting at an unexpected sound we hardly hear the sound before we start. The movements affect consciousness, however, when they are carried out.

Next to these in the order of importance are *Instinctive Movements*. The word Instinctive is applied to a movement of a certain complexity, which, while it bears a certain resemblance to a voluntary movement, is not acquired by the individual, but is the outcome of congenital arrangements. The instinctive actions of animals, such as the nest-building and incubation of birds, are familiar examples. Instinctive movements differ from reflex, partly in their complexity, *i.e.*, the number of distinct muscular actions entering into them, and still more clearly in their conscious accompaniment. A bird, when the migratory instinct takes it, is the subject of sensations with a well-marked feeling-tone, *viz.*, that of discomfort, and a restless craving. While subserving a bio-

logical purpose, such as self-preservation or conservation of the species, they have no psychical purpose. Man, having to acquire by individual experience knowledge how to act, is far less fully supplied with instinctive movements than the lower animals. Nevertheless, the child possesses a certain number. Some of these, as the action of sucking, are necessary for the maintenance of the child's life, and so are perfect, or nearly so, at the outset. Others are very early developed. This applies to the special motor reactions which spring immediately out of states of pleasure and pain, as crying and laughing. Others, again, as the movements of walking, appear still later.

Some physiologists and psychologists include a third class of primitive movements, *viz.*, *Impulsive* or *Spontaneous* movements. They are illustrated by movements of the limbs during sleep or immediately after waking. They are supposed to have no antecedent in the shape of sensory stimulation, like Reflex and Instinctive movements, but to arise solely out of certain changes of nutrition in the *motor* centres. They can only affect consciousness through the medium of the motor sensations which accompany them.

In addition to these primitive movements, there are certain congenitally determined *connections between movements*. Thus the alternate forward movement of each of the two lower limbs which enters into walking is predetermined by congenital nervous arrangements. A child long before it can walk, if held in the nurse's arms so that it can just touch her lap with its feet, will carry out this rhythmic sequence of movements.

Development of the Senses. The several elements here enumerated, though congenitally predetermined, do

not all appear in perfect form at the beginning of life. This applies not only, as we have seen, to certain unacquired movements, but also to the sensations obtained by stimulation of the sense-organs. In other words, *the senses require a certain time for the development of their proper functions.*

What is commonly spoken of as the development of the senses includes the exercise of the *mind* in attending to sense-impressions and rendering them definite and distinct one from another. With this we are not now concerned, but only with the development of the sense-apparatus itself. This development is illustrated in the fact that children are born deaf, and may even remain so for a day or two, only gradually developing after this a complete normal sense of hearing.

While the sensory apparatus thus requires a certain time for its development, the motor organs require a longer period. This is particularly evident in the case of the organs of locomotion, which only reach the development needed for carrying out their functions about the end of the first year. Other movements, as those of the hand and arm in grasping, and of the head and eyes in following a moving object, and turning towards one, require a term of tentative practice before they get carried out in the required way. This need of a term of apprenticeship for carrying out movements with precision is one cause of the slow development of the senses. Even a "quick ear" depends in part on readiness in carrying out movements of the head.

Differences of Sense-Capacity and Motor Ability. By sense-capacity is meant the degree of natural endowment of a sense which determines and limits the range of

possible improvement by exercise and training. Differences of sense-capacity appear among what are called normal children. (*a*) In the first place, there are differences in the *keenness* of a sense, as determined by the weakest stimulus which will just produce a sensation.[1] It is found that in all persons alike certain areas of the skin require a greater pressure than others before they yield a sensation, and so have less keenness of sensibility. In like manner one child may require a more powerful stimulus of sound than another child before he has a sensation of hearing.

(*b*) Of greater importance than this responsiveness to weak stimuli is the discriminative sensibility already touched on. This determines the degree of *fineness* of the sense. Different children cannot, with a like amount of exercise, be made to discriminate the same number of shades of a colour, or of gradations of pitch in a semitone interval. This is the really important side of sense-capacity from an intellectual or knowledge-giving point of view. It does not vary precisely as keenness. A may be more quickly responsive to a stimulus than B, and yet not be more discriminative.[2]

These differences sometimes appear in a particular sense only. Thus there are children who are dull or obtuse, or both, in respect of hearing, though they may be quick and discriminative in respect of seeing. Such defects clearly point to a special deficiency in the par-

[1] Wundt calls this mode of sensibility "absolute sensibility," marking it off from "discriminative sensibility".

[2] What we call acuteness of a sense probably involves both quickness or keenness and fineness. An acute ear is one which reacts on weak stimuli, and also discriminates finely one sound from another.

ticular organ concerned. In other cases the dulness and obtuseness may be more general, and point rather to a low brain-development and want of nervous energy.

It is important to add that children vary greatly in the first months in respect of the liveliness and precision of their *motor reactions*. It is a familiar observation that some children react more promptly to sensory stimulation, and give fuller motor expression to their feelings, than others. These differences affect the rapidity of the development of the senses. Thus some learn to move their eyes (or head) and hands much quicker than others, and in this way come much sooner to the full exercise of these organs. Careful observations on these early movements and their variations are much needed.

The Early Care of the Senses. Since the senses, together with the motor organs which are so closely connected with them, supply the nutritive material for the whole mental life of the child, the observation of their activities and the care for their efficiency in the first years of life are a matter of great educational importance. The closest attention should be given by the mother and the teacher to the senses, more particularly those of sight and hearing, which, owing to the special delicacy of their peripheral organs, are liable to be deranged by a variety of causes.

Here the first thing is to exclude from the surroundings anything, such as a bad mode of illumination or a defective print in books, which is likely to injure the eye. A like care should be given to the organs of movement, over-strain of the muscles of the eye and the hand—more especially the small muscles of the fingers—being carefully avoided.

Not only should positive injury to the organs of sense nd movement be thus guarded against: the teacher hould *carefully adjust all sense-work to the conditions f favourable and easy activity.* Here the importance f magnitude and scale in showing visible objects, such s letters to be copied, geometrical figures and the like, ecomes apparent. A child is apt to be called stupid be-ause the object he is asked to inspect with his eyes is nfavourable to a clear visual dissection of it, and to that nore vivid sense of line which grows out of *movement long the line.*

With this general care there should go a careful neasurement of the several sense-capacities. In par-icular any latent defects of discriminative sensibility hould be discovered and noted down. The methodical rocedure which has recently been invented by science or measuring sense-capacity will be explained presently when we come to deal more fully with the discriminative rocess. Here it may suffice to say that an important art of the educator's work is to measure sense-capacity, nore especially that of the two higher senses, and to ob-serve carefully any indications of marked defect, such as ote or tone deafness, that is, inability to recognise an rdinary musical interval, say that of a semitone, or of colour blindness, that is, inability to discriminate colours.

REFERENCES FOR READING.

A fuller account of the Senses may be obtained from the following: John McKendrick, *The Physiology of the Senses* (John Murray), E. B. Titchener, *An Outline of Psychology*, part i., chaps. ii.-iv. (Macmillan).

The early development of the Senses is dealt with by W. Preyer,

The Senses and the Will, first part, chaps. i.-v., and second part, chaps. viii.-xi. (Appleton & Co.), and by G. Compayré, *The Intellectual and Moral Development of the Child*, chaps. ii.-iv. (Appleton & Co.).

[References to works on the Education of the Senses will follow more appropriately the discussion of Sense-perception.]

CHAPTER VII.

MENTAL ELABORATION: ATTENTION.

PSYCHICAL MATERIALS AND THEIR ELABORATION. Having briefly surveyed the field of sensation which supplies the raw material on which our intellectual life sustains itself, we may proceed to consider the processes by which this material is worked up or elaborated into the later products, such as perceptions and ideas; our object will be to find out the simplest processes by the co-operation of which the movement of intellectual development can be understood.

ATTENTION AS A FACTOR IN ELABORATION. The first and simplest phase of the process of elaboration is that reaction which serves to make a sensation a prominent and for the moment a supreme element in the stream of consciousness. This reaction is known as Attention.

Now attention is a phenomenon of the *active* phase of mind, and as such can only be adequately studied later on when we take up the subject of conation. At the same time, seeing that it is present in a lower form at least in all the fully developed processes of our intellectual life, we must make a preliminary study of it at the outset. Here, however, we shall be concerned with the process mainly as a *determining* factor. The understanding of it *as itself determined*, more particularly by

feeling and conation, will only be possible after a study of these two domains of phenomena.

Grades of Consciousness: the Sub-conscious. In taking up the subject of attention we are confronted with a fact hitherto ignored, *viz.*, *that psychical phenomena present themselves in unequal degrees of definiteness and prominence.* Thus a sound may affect our consciousness only feebly and vaguely, as when we are sleepy, or our attention is occupied with other things; or it may grow distinct and "stand out" in our consciousness, as when we are interested in knowing what it is. This fact must now be set forth and illustrated.

Our mental life consists of different levels or heights, according to the degree of consciousness involved. The lowest level is that of indistinct consciousness. This includes that confused mass of sensation, thought, impulse and feeling which forms the dim background of our clear mental life. At any moment we may by a special effort of attention become aware of the presence of such vague elements as bodily sensations, more or less agreeable or disagreeable, half-developed recollections, obscure and undefinable feelings, confidence, alarm, and so forth. This dim twilight region of our mental life may be marked off as that of the Sub-conscious.

It is evident that those parts of our mental life are of most importance which are capable of being brought to the level of clear consciousness. Speaking generally, we may say that the bodily life, more particularly the vegetative processes of assimilation of food, circulation of the blood, etc., yields only a vague kind of consciousness. Although, as we shall see, the state of the vital organs exerts a profound and far-reaching influence on our mental life, it does not give rise immediately to definite sensations. The region of clear consciousness consists of the sensations of the special senses, which, as we have seen, are fitted to

acquire definiteness of character, and along with these the voluntary movements by which we react on our sensations, and, lastly, the processes of thought, deliberation and choice which accompany these movements. We may say, then, that the sub-conscious is the region of vague sensation and blind unreflective impulse or "instinct," which we have reason to suppose makes up the mental life of the lower animals. The higher level of clear consciousness answers rather to the distinctively *human* aspects of our mental life, to thought, reason and choice.

It follows from this account of the sub-conscious that what we call the development of our mental life means a gradual emergence of clear consciousness out of the dim region of the sub-conscious. In infancy we have to do with a sub-conscious type of life: development and education serve to introduce more and more of clear consciousness.

General Function of Attention. Since attention is the process by which obscure half-formed products of our consciousness take on clearness and completeness, it must, it is evident, play an important part in the economy of our mental life. It serves to bring about an orderly arrangement and a simplification of this life. At any moment of full wakefulness we are assailed by a multitude of sensations, some due to external objects acting on our senses of hearing, sight, and so forth, others arising out of changes in the organism, as those of heat, cold, hunger, etc. The process of attention is *selective*, and helps to give a hearing at the moment to some one of the crowd of soliciting applicants. In this way the successive movements of attention, so far as they enter into our psychical processes, tend to reduce the multiplicity and confusion which present themselves to *a single orderly thread of events* which we can afterwards more or less completely retrace.

While, however, we thus at the outset assign so unique a place and so prominent a function to attention, it must be borne in mind that in all its more energetic degrees it is but an occasional ingredient of our mental life. Not only does the region of organic life but rarely become the object of such close attention; the higher plane of conscious life itself, including sensation, voluntary movement, and the intellectual processes, such as perception and memory, involves less and less of the concentrative element *as these processes recur and grow familiar and rapid*. In this case, as was pointed out above, the nervous mechanism, with which every part of our mental life is correlated, gets adjusted to a new kind of functional work.

We may say, then, that attention is an extra output of mental activity which is especially required for all *advance*, and particularly for acquiring *new* aptitudes. Thus a child has to attend closely when first learning to walk, though when the action is perfected by practice he need hardly attend at all to what he is doing. So with perceptions and ideas. We can recognise objects of daily use, as our hat, or our pen, by a rapid, barely conscious glance; but in recognising less familiar objects we have to attend closely. We mentally run over a train of ideas which we have at our fingers' ends, as we say, with the least amount of attention; in mentally getting hold of a new order of ideas, as in reading a work of science, or the more difficult sort of modern novel, we have to put forth a special effort of attention. It follows that on the amount of attention a child is ready to give will depend the rate of his advance in knowledge and in the use of his active powers. Atten-

tion is the supreme manifestation of vital energy, of brain-vigour, and its abundance or deficiency affects the whole of a child's mental progress. No part of the mental mechanism is thus of more practical interest to the teacher than the processes of attention. The rise and fall in the freshness and vigour of attention demand the teacher's careful observation, as signs of fluctuating mental vigour ; and in stimulating and directing mental activity he will be primarily concerned with the *conditions* of a lively and prolonged attention.

DEFINITION OF ATTENTION. Attention may be defined as mental activity, which immediately results in the raising, in intensity, completeness, and definiteness, of certain sensations or other psychical phenomena, and a corresponding lowering of any other simultaneously presented sensations, etc. Thus in attending to a particular voice in a chorus I mentally raise this impression of sound to its full intensity, and render it distinct, and in so doing cause other sounds to be comparatively faint and indistinct.

It is implied in this definition that attention has its direction determined by a presentation, as for example, by the sight of a bird flying across the sky. Anything present to the mind when it thus becomes reinforced by attention is said to be the " object " of this attention.

Objects of attention are either sensations, and their combinations, *viz.*, complex presensations,[1] or what we call ideas or representations, *e.g.*, the mental image of a friend's face. In this preliminary account of attention we shall confine ourselves as far as possible to the earlier

[1] These correspond to what we call " external objects," which thus constitute only one variety of " objects of attention ".

and " outer " direction of attention, *viz.*, attention to sensations. The process of " inner " attention, or attention to ideas, will be dealt with more fully hereafter.

In its earliest and simplest form attention is to be conceived as a kind of reaction upon a sensation, already partially excited by the proper peripheral process of stimulation. Thus, in the above example, it is the whole process of excitation due to the movement of the image of the bird over the retina which arouses the mental attitude of *looking at* and so specially attending to this object. This attitude of looking obviously involves a muscular action, turning the eye in the required direction, and so forth. This muscular side of the process of attention will occupy us presently.

Again, our definition of attention implies that it is at once a reinforcing and a weakening of psychical contents. We cannot attend in one direction and so intensify a particular presentative element without at the same moment withdrawing attention from other directions, that is to say, checking or *inhibiting* other simultaneous presentations. To look closely at a thing is for the moment to be partially blind to surrounding objects, to see them at best only very indistinctly. Attention is thus essentially a narrowing or *concentrating* of consciousness, that is, a converging of mental light on the central or " focal " part of the field of vision, and a correlative darkening of all the " marginal " portion.

Attention varies in its intensity or strength. We popularly talk of attending only where we put forth a specially high degree of exertion, and do so moreover by what is called a volitional effort. But the activity of attention reaches far below this occasional and excep-

tional effort. During waking hours at least there is always some amount of that mental exertion which we call attending. It follows that what teachers often call inattention does not mean total absence of attention, but a wrong direction of attention. A child may be sleepy or stupid and not attending to anything in particular, but more frequently children's inattention is mental energy diverted into wrong directions.

The characteristics of the true state of inattention or mental listlessness are relaxation of effort and a substitution, for a lively predominance of certain perceptions or ideas, of a dull level of vague sensations and thoughts. These features of inattention are brought out by the common expression "scattering" or "dispersion" of thoughts, and the corresponding French term *distraction* (*cf.* the German *Zerstreutheit*).

Nervous Process in Attention. The fact that attention is a mode of *active* consciousness suggests that it is accompanied by certain *motor* processes: and observation bears out this inference. Thus, to begin with the simplest mode of attention, *viz.*, to sensations, when we are looking at an object attentively, we are carrying out a number of motor adjustments—such as accommodation of the lens and alteration of convergence—which subserve perfect vision. Similarly in active touching, and even in listening, attention seems to stand in closest connection with certain motor adjustments of the particular sense-organ engaged. Such movements may accompany higher processes of attention, as when we screw our eyes up in order to *think* of something, just as if we were peering into space for the thought.

Whilst attention is thus aided by certain definite move-

ments, it requires the inhibition or exclusion of all other unrelated movements. Thus we have to keep the eyes and head *steady* when we wish to look carefully. In walking we are very apt to stop when thinking out some difficult question. Fidgety movements in children are a great bar to close attention.

In addition to this motor or muscular factor, the physiological process in attention probably involves some change in the distribution of nervous energy in the brain whereby those regions which are especially engaged are thrown into a state of greater activity. Thus in looking at an object intently it is probable that the centre of vision is thrown into more energetic action, the other regions of the brain being inhibited or impeded in their action.[1]

Extent or Area of Attention. All attention is a narrowing of the conscious field, and so may be described as a concentration of mental activity, or a focussing of it on a definite point. But all processes of attention do not embrace equal areas or extents. Just as in looking at a landscape we may fix the eye either on a small object, as a distant castle, or on a larger portion of the scene, as a chain of hills, so we may direct attention to a smaller or larger range of presentations. Thus I may attend to some particular localised sensation, say in my finger, or to the condition of my body *as a whole*.

It is to be observed further that even when we single out for special attention some object in a group (or some particular feature of an object), the other objects of the group (or features of the object) may be *indistinctly*

[1] On the physiological accompaniments of attention, see Ribot, *La Psychologie de l'Attention*, chaps. i. and ii.

apprehended in the margin or background of consciousness. Thus in looking at the Houses of Parliament there is along with the distinct presentation of the buildings themselves the indistinct presentations of the river and other surroundings. In other words, *the selective act of attention does not wholly exclude from the mind other impressions or ideas, but throws them back into the dim margin of consciousness, and that which lies in the focus of consciousness and is specially attended to may all the time be vaguely apprehended in its relations to its surroundings.*[1] The importance of this fact will come out when we take up the subject of perception.

In general it may be said that the more objects we try to include in our mental glance the less distinct will be the result. This is seen plainly in all efforts to attend to a variety of *disconnected* things at one time, as when we are reading a book and listening to a conversation. "One thing at a time" is a universal law of our mental activity, and the carrying out of distinct occupations is only possible where repetition and habit release us from the strain of close attention, as when we carry on "subconsciously" some familiar manual operation, while our attention is really engaged in listening to another's talk.

Where, however, we have to do with impressions of the same sense attention may embrace several of them at one moment. Thus it has been calculated that we can at one and the same instant attend to from four to five printed letters when placed near one another. This comprehensive grasp of a number of details in a single

[1] This fact that what we make "focal" by selective attention is discerned in its relations to a dim marginal background is emphasised by Prof. Lloyd Morgan. See his *Psychology for Teachers*, p. 62 ff.

act of attention becomes of great importance in viewing things *in their relations one to another, e.g.*, to the left and the right, above and below, and so forth. It lies at the basis of all perceptions of things as forming parts of a whole, as when we judge of symmetry, proportion, and the like. In the case of successive impressions, such as musical sounds, the same power of simultaneous grasp is seen in the perception of rhythmic relations. In this case the preceding impressions persist in consciousness side by side with the succeeding ones, and we *hold them together* by a single act of attention.

ON WHAT THE DEGREE OF ATTENTION DEPENDS. The amount of attention exerted at any time depends on two chief circumstances: (*a*) the quantity of nervous energy disposable at the time; (*b*) the force of the presentation which excites the attention, or, in case of competing presentations, the superiority of the force of the presentation over that of rival presentations.

It is a matter of common observation that when we are vigorous, wakeful and active a feeble stimulus will suffice to bring about attention. A healthy child in the early part of the day has a superabundance of brain energy which shows itself in attention to all sorts of small and comparatively uninteresting matters. Indeed his activity prompts him to seek out objects of attention in his surroundings. On the other hand, a tired or weakly child will need a powerful stimulus to rouse his mental activity.

The attractive force of a presentation may reside in some inherent quality of this presentation, as when a sound becomes attended to by reason of its loudness; or it may spring out of some relation of the presentation to

our pre-existing ideas, expectations, needs. The last illustrates what is commonly meant by *interest.*

NON-VOLUNTARY AND VOLUNTARY ATTENTION. It is customary to distinguish between two kinds of attention according as it is called forth by the mere force and attractiveness of a presentation, or requires in addition a preceding desire and purpose to attend. The former is known as non-voluntary attention.[1] It may also be called reflex (or automatic) because it bears a striking analogy to reflex movement, such as blinking when an object is suddenly brought near the eye, which is clearly non-voluntary or unintentional, a merely mechanical response of the muscles to a process of sensory stimulation. On the other hand, when we attend to a thing from a desire, such as curiosity or a wish to know about it, we are said to do so voluntarily. These two modes of attention, though properly distinguished one from another, are both our *acts*, and will be found to shade off one into the other in our mental life.

NON-VOLUNTARY OR REFLEX ATTENTION. This is the earlier form of attention, and the one with which the young teacher is specially concerned in the first stages of instruction. Children are wont to put forth the activity of attention, not in order to gain some object, as knowledge, but because what they see or hear attracts them

[1] Non-voluntary means merely absence of volition. What is called involuntary attention, as when we attend to a sound *in spite of* our resolve not to listen, is of course more than this, and must be carefully distinguished from it. The student should further note that non-voluntary does not mean the attention which a teacher may force from a child by a threat of punishment. This is, strictly speaking, voluntary, since it is prompted by the desire to avoid something.

in some way. Reflex attention always follows the lead of the greatest attraction of the moment.

In its simplest form, as a momentary turning of the mind to a presentation, attention is a reaction called forth by a powerful sensory stimulus, such as a brilliant light, a loud sound, or a sharp blow. Every teacher knows the value of a strong emphatic mode of utterance in commanding the attention of his pupils; and this effect is partly due to the action of strong sensuous impressions in rousing mental activity.[1]

LAW OF CONTRAST AND NOVELTY. This momentary direction of the attention is governed by the law of Change or Contrast. According to this principle, an unvarying sensuous stimulus, *e.g.*, a sound, if greatly prolonged and unvaried in its intensity, fails to produce a conscious impression. The constant noise of the mill soon ceases to be noticed by the miller who lives near it; whereas the *cessation of the noise*, as a great change in the environment, has been known to impress his consciousness even in sleep. The explanation of this is that a prolonged impression, even if a powerful one, ceases to excite the attention. Hence, the teacher who continually or very frequently addresses his class in loud tones, misses the advantage of an occasional raising of the voice.

On the other hand, a sudden change of impression, as when a light is brought into a dark room, or the report of a gun breaks the stillness of the country, acts as a powerful excitant to the attention. For the same reason a strong contrast between impressions, as in the transition from high to low or from soft to loud in music, or in the

[1] Compare Herbart's "Involuntary Primitive Attention" (Felkin's *Introduction*, p. 38).

juxtaposition of a bright and a dark colour, serves as an excitant.

Novelty, so mighty a force in childhood and a considerable force throughout life, is only a further illustration of this law of change. For something new attracts the attention because it is a change from, and contrasts with, our ordinary surroundings and experience. It excites the mind, very much as a startling contrast excites it.

The attractiveness of change is seen too where it is gradual, as in the case of all visible movements. The fascination of moving objects for the infant's eye is well known. A part of the danger, for the teacher, of the window looking into the street is that the street is the scene of perpetual movement.

INTEREST. When it is said that we only attend to what interests us, there is a reference to the truth that attention is under the sway of *feeling*. A novel or unexpected sight may excite a germ of feeling in the shape of a momentary surprise or wonder. But when we are interested a deeper and more lasting feeling is excited, so that our attention is kept fixed for an appreciable time. This "interested attention," as it may be called, is of a higher kind than the momentary response to a powerful stimulus, as it is more the outcome of a child's self, of his inner nature, instincts, etc. It begins to appear very early in child-life.

The feeling-element which here sustains and prolongs the attitude of attention may be disagreeable or agreeable. Presentations which are unpleasant, such as the sight to a child of the preparations for punishment, exercise a peculiar spell on the mind which is sometimes described as "painful interest". The healthier kind of interest,

however, is awakened by agreeable presentations, which please at the moment, and which last long enough to give promise of further pleasure.

Keeping to this more normal pleasurable interest, we may say that it arises in the following ways. (1) It may be excited when the object is in itself of such a kind as to give immediate pleasure to the child in the very act of attending to it. Thus an infant will keep its eyes fixed for a time on the lamp brought into the room because of the agreeableness of the impression. The production of pleasure in connection with any mode of activity tends, as we shall see by-and-by, to intensify and prolong this activity. This influence of the agreeable side of sense-impressions on the attention may be said to form the germ of Æsthetic Interest.

(2) Another great source of interest is the relation of the presentation of the moment to the child's past experiences and personal concerns. This relation means that the new impression is assimilated or "apperceived" by being brought into relation to a previous like impression or group of impressions having a marked feeling-tone. When, for example, a child listens to the sound of the water poured into his bath, of his mother's step as she enters the room, or later on to others' talk about himself, his interest is due to the fact that the new impression has acquired a meaning for his intelligence and a value for his feeling through its recognised kinship with his past pleasurable experiences. Such attention to new impressions because of their recognised connection with the child's comfort or happiness constitutes the germ of Personal or Practical Interest. This interest, again, may, with the growth of affection and

sympathy, expand into *a human interest*, *i.e.*, an interest in others' well-being.

(3) Lastly, interest may assume a more distinctly Intellectual form, or an interest in new ideas, facts and truths. Here the process of assimilating, of understanding the new and strange impression, itself contributes a pleasure, the germ of the delight in knowledge. It springs up in different ways. It arises most naturally out of a feeling of wonder at what is new, strange and mysterious, as when a child sees a strange visitor with some mysterious appendage, as an eye-glass. The newness and strangeness act as a stimulus to the attention. In this close quizzing of the new by the young eye, we have the germ of the impulse to assimilate what is strange, to bring the new and foreign object into relation to the old and familiar ones. In its higher forms this delight in mastering new strange-looking presentations takes on more of a volitional character, becoming what we call curiosity or the *desire* to understand.

It is to be observed that this Intellectual Interest is greatly supported at first by Æsthetic and Personal Interests. A child in beginning to *notice* things commonly starts with something pretty, such as a flower or bird; or with something associated with his comfort, the satisfaction of his wants, or his favourite occupations, as, for example, the whiteness of his milk, the colour of pussy's eyes.

Familiarity and Interest. It follows from this that mere novelty, though a powerful stimulus to the attention, and capable of leading on to curiosity, is not sufficient to detain and fix the attention. What is wholly strange and consequently unsuggestive to a child will

never engage and occupy his mind. In walking down a new street, for example, a child will as a rule notice those things which in some way remind him of, and connect themselves with, what he already knows and likes, *e.g.*, if he is fond of horses and their doings, the harness in the saddler's shop. Miss Edgeworth tells us of the want of interest in the wholly unfamiliar and too strange London sights which was manifested by some Esquimaux who visited our capital (*Practical Education*, ii., p. 118). While therefore the principle of change tells us that *perfect* familiarity with a subject is fatal to interest, the laws of intellectual interest tell us that *a measure of* familiarity is essential. The principle of modern intellectual education, that there should be a gradual transition from the known to the unknown, is thus seen to correspond not only with the necessities of intellectual movement and development, but also with the natural laws of development of those feelings which inspire attention and so call the intellectual faculties into play.

TRANSITION TO VOLUNTARY ATTENTION. A little thought will show that each of these modes of action of feeling upon attention leads on to the beginning of voluntary attention. Thus a child observing some pretty object soon begins to *desire* a continuance of the pleasure of watching it, and so attends, in a measure, voluntarily. This is especially true in the case of moving things, such as insects and other animals whose constant changes give rise to a vague expectation of what is coming. So again, in the case of personal interest, a child on listening to talk about himself soon comes to expect something agreeable, and listens *in order to* enjoy. The same thing is clearly true of intellectual attention,

Wonder, as we often say, passes into curiosity, and curiosity, as a *desire* to see something or understand something, involves a conative process, a simple volitional attitude. This is illustrated in the maintenance of the expectant attitude of mind by a class of children when the teacher is presenting interesting materials, for this expectancy is due to a vague anticipation of coming gratification and a desire to realise this. Here, then, we see how the earlier and lower form of attention gradually passes into the later and higher.

Expectant Attention. The attitude of attention here touched upon is of the greatest educational importance. If attention were confined to presentations[1] already before the mind intellectual development would be but a rudimentary process. All the higher attention implies *a process of preadjustment to what is about to be presented.*

This preadjustment may assume the form of preparing for a definitely known presentation. If, for example, a drill-master says beforehand to his class, "When I say 'March!' begin to march at once," the children's minds are on tiptoe, so to speak, the brain-centres are active, carrying out in a measure beforehand the required adjustive processes, so that when the order actually occurs it is carried out more quickly than if there had been no such warning and preparation. Experiments have shown that motor responses to a signal, *e.g.*, pressing on the button of an electric key as soon as a sound-signal is perceived, are quickened, that is to say, the *reaction-time* is diminished, in proportion to the degree of perfec-

[1] The word presentation may here be taken to include ideas as well as sense-presentations.

tion of the preliminary process (*i.e.*, the closeness and fixity of the attention, and the precision of the anticipation).

In this expectant attention there may be a definite anticipation of the coming presentation, as in the illustration of the drill-master. In this case the preparation involves a calling up of a definite *idea* of what is coming. A class of school children watching the clock, which is about to announce the close of the morning's school, imaginatively realise beforehand the strokes of the clock. The attitude of expectant attention is different where there is not this definite anticipation, as when a child wonders what there is going to be on the dinner-table, or what the teacher is going to talk about. Here the preparation implies the preliminary activity of certain brain-centres and the connected sense-organs, as in "pricking up" the ear and fixing the eye.

There is a measure of this same general preliminary activity of brain and mind in watching the actions of an animal or person, in listening to a story, and so forth.

FUNCTION OF THE WILL IN ATTENTION. It is impossible at this stage to explain fully the nature of volitional attention. As a conative process it obeys those laws of volition which will be expounded later on. Here it must suffice to indicate briefly one or two more important effects of the growth of volition upon attention.

(1) It is plain that after volition appears on the scene the forces of non-voluntary attention continue to be active as *tendencies*. And the range of the will's action is in every case limited by these. Thus the most studious of children finds that there is some force of external stimulus, as a disturbing noise, or an exciting spectacle, against which his will is impotent.

(2) Again, although after the required training a child learns to *direct* his attention at will, he has no power to keep his attention closely and persistently fixed on any presentations or ideas which he (or somebody else for him) may happen to select. Something further is necessary to that lively interaction between mind and object which we call a state of attention; and this is interest. The will introduces, so to say, mind and object: it cannot force an attachment between them. For this, interest must be developed. What the initial volitional process effects is thus *the direction of the interest that shall prevail at the time.*

It is important to note that after a certain strength of initial concentration, attention, provided interest is aroused, may take care of itself. *The process becomes similar to the earlier reflex type.* That is to say, the object attended to, whether events in the physical world or ideas brought before the mind in reading or otherwise, *holds and dominates the attention.* In this way prolonged processes of attention are greatly simplified by being freed from the accompaniment of volitional effort.

The importance of this initial effort in a prolonged process of attention depends on the fact that in many cases *a lively interest is only developed after the mind and the subject-matter have remained in contact for some time.* Many subjects do not disclose their attractions at once and on the surface, but only after they have been more closely examined. Thus the pleasure of a beautiful poem or of an arithmetical problem only comes to the child who is ready to give his mind at first without the bait of pleasure. Hence a child who is ready to exercise his will at the outset under the in-

fluence of some motive not connected with the subject, as the desire to please his parents or teacher, makes acquaintance with new and unsuspected varieties of interest. The "finding one's way" in a new branch of study illustrates this gradual substitution of an agreeable activity for what at the outset was a comparatively disagreeable one, requiring an "effort of attention".

EARLY DEVELOPMENT OF ATTENTION.

INFANTILE REACTIONS. As has been observed, the early form of attention is the reflex or non-voluntary. An infant first manifests the rudiments of attention by a cessation of movements of the limbs, a wide opening of the eyes, etc., when some bright object, say a lamp or the mother's face, comes into its field of view. Moving visible objects more especially excite this early form of attention. The energies of attention appear to be roused to a specially intense and prolonged activity by a strong feeling, as that supplied by the experience of sucking. It is by help of these early simple responses to sense-stimuli that the power of attention begins to grow. By this is meant that after a certain number of exercises less powerful stimuli suffice, in the absence of more powerful ones, to call forth attention. Thus by fixing the eye again and again on especially bright objects, such as the moving fire-flame or a candle, the infant is preparing to direct it (still non-voluntarily) to the mother's face, its own hands, and so forth, when these objects happen to come into the field of view. With the progress of the first weeks, too, many things at first indifferent acquire a secondary kind of interest. Thus from gazing on the

moving flame the child easily passes to a scrutiny of the glowing coal, and the fire-irons reflecting the light. In a similar way a child passes from sources of pleasure to the accompaniments of these. For example, he soon learns to attend to the visible movements and sounds which come to be associated with the pleasant experience of the meal and of the bath. As recurring experiences render the infant's surroundings familiar, we note the development of a special attention to what is new and strange, such as a new dress on the mother, a strange face, and so forth. Very early too, certainly within the first months, we may note the influence on the attention of the formation of groups of ideas and permanent sources of interest, as, for example, pussy, the mother, favourite toys or pictures. These centres of interest increase in number and become more far-reaching in their influence as mental development advances.

First Manifestations of Voluntary Attention. While the non-voluntary form of attention is thus expanding, following out new directions, we may observe the beginnings of a voluntary control of the attention. The first step in the direction of voluntary attention is seen in the early forms of expectant attention, as in continuing to gaze at an agreeable object, such as a brightly coloured toy or picture held before the eye, in following a moving object with the eye, and better still in looking down for an object, such as a toy, which has fallen on the floor. With these infantile actions may be compared the first turning of the head in the direction of a sound heard and listening, which appears to take place about the end of the third month. A clearer manifestation of a simple voluntary direction of attention is seen

in the attitude of expecting or looking out for something. Within the first three or four months the infant begins to explore its surroundings, looking out for objects to inspect or examine.

Professor Preyer gives an interesting account of the first movements of attention in his sketch of the development of sight and hearing (*The Mind of the Child*, part i., chaps. i. and ii.). He thinks that his child began to explore the field of vision in search of objects before the end of the third month. He puts the first appearance of volition, properly so called, a month or two later. This suggests that the simple action here spoken of is a transition from the reflex to the voluntary form of attention. Others, as M. Perez, think they discover the germ of voluntary attention considerably earlier. (See Perez, *The First Three Years of Childhood*, p. 112.)

By such simple exercises falling within the first few months, the activity of attention is little by little brought under control. Although the full understanding of this process must be delayed till we take up the subject of the growth of will, we may be able to anticipate to some extent, and indicate the main lines of the progress.

The growth of voluntary attention implies, it is evident, a continual reduction of the difficulty of attending to objects. The law that exercise strengthens faculty applies here. What is first done with labour and sense of difficulty is, with repetition and practice, done more and more easily. Thus an infant learns to direct its attention to visible objects by more rapid and precise movements of the eye and head. At the same time, as the result of such exercises, more difficult tasks become possible. Thus a child in the second half of the first year may be seen to embrace more objects in an act of attention, and to prolong the exertion of attention to

a series of events, such as musical sounds, a complicated action of the mother, and the like.

Attention to the Unimpressive. Among these new and more difficult attainments we have *attention to what is small, inconspicuous and unimpressive.* This extension of the range of attention is largely due to the growth of centres of interest which radiate, so to speak, their attractive influence on a larger and larger area of objects. Thus pussy's hair, claws, and so forth grow interesting just because pussy herself has become interesting. Such an embracing of the less conspicuous and striking features of the environment is due too to an advance in the carrying out of the process of attention, and to a firmer control of the process by the will. After having listened again and again to his mother's voice when she says something of great interest, the child tends to go on attending to her words when these are of less interest. When no strongly impressive objects are present to the child's senses, his impulse of activity will ensure a certain amount of attention to the less conspicuous and striking ones.

Concentration of Mind. Another aspect under which the growth of voluntary attention may be viewed is *the ability to detain objects before the mind.* As we have seen, reflex attention is for the most part a process of flitting from point to point, as new objects of sense, and new solicitations present themselves. A more persistent and sustained attention begins to show itself under the spell of interest, as when a child watches an animal feeding or listens to a thrilling story. A firm fixing of the attention always involves, however, some amount of will-force or *determination to attend.* Locke does not

exaggerate when he says that it is "a pain to children to keep their thoughts steady to anything". It is only as the attention comes under the control of the will, and as the will grows strong, that it takes on that dogged determined look which is what we mean by *concentration of mind.* To attend to a thing "voluntarily" in the full sense of this expression is resolutely to hold the mind to it. The peculiar value of all instruction in the home and in the school is that it requires a prolonged setting of the attention, which, though largely sustained by growing interest in the subject, is throughout reinforced so to speak by a firm determination of the will.

This firm holding of the attention to a subject clearly implies the power and the disposition to *resist the solicitations of extraneous and distracting objects.* A voluntary concentration of mind means that we mentally hold on to a particular subject, and resolutely exclude all disconnected and irrelevant subjects. A child that is bent on examining some object will, in proportion as his mind becomes absorbed in the observation, become indifferent to other and distracting sights and sounds. It is evident, too, that the beginnings of internal attention, of that fixing of ideas and following out of their suggestions on which all instruction is based, imply the development of this power of resistance. A child only learns to think in proportion as he learns to shut out the sights and sounds of the external world. The capability of resisting such distractions varies considerably, and is greatly improved by practice. A child when first sent to school finds it hard not to look at his companions or out of the window when a lesson is being given.

By-and-by he will be able to fix his mind on his lesson even when some amount of disturbing noise is present.

This power of concentration, that is to say, of prolonged and dogged attention to the disregard of all distracting solicitations, is a distinguishing characteristic of the energetic student and man of action. By common consent it is one main factor in all great achievements, whether in art, in science, or in practical affairs. Its high value illustrates the great part taken by the *will* in all intellectual development. Although dogged industry will not transform a stupid into a clever child, it is indisputable that a boy or girl with average intellectual powers can, *when these are backed up by a strong will*, attain to a very respectable height of achievement.

HABITS OF ATTENTION. The growth of voluntary attention means *the gradual formation of certain habits*. By a habit we mean a fixed disposition to do a thing, and a facility in doing it, the result of a determined and methodical repetition of the action. The growth of the power of attention may be viewed as a progressive formation of habits. At first voluntary concentration of mind requires a spur and an effort. As soon as the pressure of a strong motive is withdrawn, the young mind returns to its natural state of listlessness or wandering attention. A habit of attention first appears as a recurring readiness to attend under definite circumstances, for example, when the child is addressed by somebody, when the teacher enters the class-room and so forth. This is what Miss Edgeworth calls " a habit of associated attention ". Later on there is developed a more permanent kind of attentiveness. The transition from childhood to youth is in normal circumstances character-

ised by the acquisition of a more general attitude of mental watchfulness, showing itself in a growing thoughtfulness about what is seen and heard.

VARIATIONS IN CHILDREN'S POWER OF ATTENTION. It has been implied in what has been said that the power of attention develops very unequally in different individual cases. With some the power *as a whole* never seems to reach a high point: these are the children of sluggish attention, the "Saunterers," to use Locke's expression, who form the teacher's crux. The power of attention, as measured by alacrity of adjustment, and by prolongation of effort without fatigue, is the index to mind-activity and to brain-vigour. Normal children with good brains have more of this power. Defective children, as shown by observations carried out on imbeciles, have less of it. Growth of mind and of brain-power shows itself most plainly and most directly in the increased quantity of attention.

Again, owing to differences of congenital endowment, as well as of exercise, we find well-marked contrasts in *the special direction* in which development of attentive power advances. And these differences help to determine the type of individual intelligence. Everybody knows the difference, for example, between the plodding child able to concentrate his mind doggedly on a subject, but slow to transfer and adjust his attention to new matter, and the quick but rather superficial child—the "volatile genius," according to Miss Edgeworth, who finds it easy to direct his attention to new objects, though hard to keep it long fixed on any one. There are many young students who are capable of great intensity of concentration under favourable circumstances, but whose

minds are easily overpowered by disturbing or distracting influences.

Finally, the ruling habits of attention will vary *according to the character of the predominant interests.* Thus one child's predominant interest in the forms and colours of objects will show itself in a marked bent to *visual attention,* while another with a strong liking for sound will develop a special habit of *aural attention.* Again, while one child lives in his senses and so has his attention habitually directed outwards, another may be specially interested in the inner life of imagination and thought, and so develop a special habit of inward or "subjective" attention.

Measurement of Attention. As already implied, attention has begun to be experimentally tested. Most, if not all, of the processes investigated by the experimental psychologist, such as reaction-time, the finest discrimination of tones, colours, etc., also the length of time required for memorising (for a short interval) a series of nonsense syllables or other material, involve attention; and the measurement of this element becomes an important part of the investigation. In this way we are beginning to have some exact knowledge of the differences in power of attention at different ages and among children of the same age, of the effects of practice in improving the attention, and so forth. The researches carried out on mental fatigue already referred to (see p. 38) illustrate the measurement of another aspect of attention, *viz.*, the variations in its quantity according as the brain is fresh and vigorous, or as prolonged exercise induces fatigue. One curious result of these researches has been to show that there are periodic oscillations in the energy and efficiency of attention, *i.e.*, periods of vigorous concentration followed by "slack" periods.

EDUCATIONAL CONTROL OF ATTENTION.

The Process of Training a Child's Attention. When we speak of training the attention it is well to remember that strictly speaking there is no branch of

education which has to do specially and exclusively with the process of attention. To exercise a child's attention means in every case to arouse interest and curiosity, and to stimulate the mind as a whole. Nevertheless, a few remarks may be made even at this early stage of our exposition on the special relation of the teacher to the processes of attention.

All intellectual guidance of the young mind implies that the educator has acquired a certain hold on the child's attention. Instruction may be said to begin when the mother secures the attention of the infant to an object by pointing her finger to it; for in leading the movement of a child's eye by the simple gesture of pointing, she is able to exercise a certain selective control over the objects of his attention. Instruction, in the fuller sense, whether by the presentation of external objects for the child's inspection or by verbal information, clearly involves at every stage an appeal to the attention, and depends for its success on the effectiveness of this appeal. It implies too the power of *detaining* a child's attention in a persistent effort. To know how to exercise the attention, how to call forth its full activity, is thus the first condition of success in education. A word or two must suffice by way of showing the bearings of our theory of attention on the methods of teaching.

It is plain in the first place that the laws of attention must be complied with. He would be a foolish teacher who gave a child a number of disconnected things to do at the same time, or who insisted on keeping his mind directed to the same subject for a long period. Yet though these conditions are obvious enough, others are more easily overlooked. Thus it is probable that a more

exact knowledge of the effects of novelty of subject and mode of treatment, on the one hand, and of total unfamiliarity on the other hand, would save teachers from many errors. Some of us can recall from our school days the wearisome effect of an oft-recurring stereotyped illustration, as well as the impression of repellent strangeness produced by a first, and too sudden, introduction to a perfectly new branch of study. The teacher cannot too often remind himself that a child's attention moves within the circle of objects which have a certain novelty and freshness, and at the same time are seen to be related to what is known and familiar. The world of the school only attracts a child's attention so far as it adjusts itself to these limits, avoiding at once the too familiar and commonplace—save, indeed, for the purpose of opening up some new and undiscovered aspect of common things—and that which is totally foreign to a child's mind and experience.

In the second place, it will be well to bear in mind that a child's power of voluntary attention is rudimentary only, and that the limited forces of the young brain must be economised by removing all obstacles and making the task of learning as attractive and agreeable as possible. It would be idle, for example, to try to enlist a child's attention if he were bodily fatigued, or if he were under the influence of emotional excitement and agitated in mind and body. Again, it would be vain to expect him to listen to oral instruction close to a window looking out on a busy street. Children's attention is, as we have seen, apt to flow outwards to the sights and sounds of the external world, and is the less easily diverted by the teacher's words towards the invisible world

of imagination and thought. Consequently, in teaching them, everything should be done to reduce the force of outward things. Do not even older students, indeed, require for the closest and most effective attention a measure of quiet and retirement from the exciting provocations of the senses?

But, again, the subject and the mode of treatment chosen by the teacher should be such as to awaken a child's interest. This is the most important principle in the education of the attention. It holds good throughout the processes of education, for, as we have seen, all fruit-bearing attention is inspired and sustained by interest. It bears more especially on the early stages of instruction before children have acquired the habits of the scholar, and find it hard to give a continuous and patient attention. The teacher of young children has before all things to make his subject-matter interesting, to lay especial emphasis on its attractive and impressive features, to invest it with pleasing suggestions, to illustrate it by ample reference to what the little learners know and like to be reminded of. Care should be taken too to excite the attitude of *expectant attention*, to arouse curiosity as to what is coming, so as to secure the full energy of the focussing act.

As the pupil grows more may of course be required in the shape of voluntary effort, of that self-control which prepares the way for close and fruitful attention. Such voluntary effort will, however, only be demanded by the wise teacher at the outset of the lesson, or at exceptional moments, when powerful distractions have to be overcome. He will put his chief reliance in the growing attractiveness of the field of knowledge for the young

mind. With this view he will carefully study his pupils so as to observe the development of their tastes and inclinations, and will adjust his teaching to this gradual unfolding of taste. Since all teaching, to be worthy of the name, must be continuous and methodical, the special aim of the teacher should be to form nuclei of interests, which may become starting-points in the development of connected systems of ideas. Thus he will seek to awaken and to fix as a permanent source of interest and inquiry a love of animals, of flowers and other natural objects, of human actions, and so forth. Such germs of interest will serve to direct the current of mental activity along definite lines. A child that has a liking for animals and their ways will grow thoughtful and inquiring about them. In this way attention to the teacher will be secured in the best possible way by enlisting the quick energetic response of the child's own mind, by provoking movements of thought that shall come to meet, so to speak, the subject-matter supplied by the educator. By so doing, moreover, the teacher will make the training of the attention a means of fixing and deepening the germs of childish interest and of gradually enlarging the field of interesting subjects.[1]

The teacher has, no doubt, to insist on attention to what is comparatively dry and uninteresting. This is illustrated in the need of learning the letters of the alphabet and the notes of the musical scale. Even in such cases, however, a judicious teacher will seek to some

[1] Volkmann remarks that the older pædagogic had as its rule, "Make your instruction interesting"; whereas the newer has the precept, "Instruct in such a way that an interest may awake and remain active for life".

extent to invest the dry details with a living interest. For the rest, such severe demands on the attention should be introduced gradually, and only fully enforced when the will-power is sufficiently developed. Great care must be taken further to graduate the length of mental application exacted, both in single efforts corresponding to "lessons," and in the collective work of the day, in accordance with the progress of the child's powers of voluntary attention. An ideal school-system would exhibit all gradations in this respect; alternation and complete intermission of mental activity being frequent at first, and growing less and less so as the powers of prolonged concentration develop.

While it is thus necessary to point out the natural limitations of children's attention, it is by no means desirable to overlook the connections between a good deal of inattention, especially in older children, and the volitional or "moral" defect which we call *indolence.* A teacher who has satisfied himself that his pupil is really capable of putting forth the exertion needed for steady and persistent attention to a subject, may rightly insist on his making the effort. The difficulty here is to distinguish want of the necessary vigour of brain and lack of motive. The proper mode of appealing to a child so as to awaken the necessary effort is a subject that belongs to the training of the will.

REFERENCES FOR READING.

For a fuller account of the process of Attention the student is referred to the following: W. James, *Psychology*, chap. xiii.; Sully, *The Human Mind*, chap. vi.; and G. F. Stout, *Analytical Psychology*, bk. ii., chaps. ii. and iii. A good account of the results of experimental

nquiry into Attention may be found in O. Külpe's work, *Outlines of Psychology*, translated by E. B. Titchener, part iii., §§ 72-76 (Sonnenschein). The reader of French will also find the following useful: Th. Ribot, *Psychologie de l'Attention* (Alcan). On the relation of Interest and Attention the student may consult the following: K. Lange, *Apperception*, part i. (American translation, Heath & Co.); Felkin, *Introduction to Herbart's Science and Practice of Education*, pp. 36-40, and p. 91 ff.

On the early manifestations and the growth of Attention the student may consult: B. Perez, *First Three Years of Childhood*, chap. viii.; G. Compayré, *The Intellectual and Moral Development of the Child*, chap. viii. The reader of German may further refer to Waitz, *Lehrbuch der Psychologie*, § 55, and Volkmann, *Lehrbuch der Psychologie*, vol. ii., § 114.

On the training of the Attention the reader may refer to the following: Locke, *Some Thoughts concerning Education*, § 167; Maria Edgeworth, *Essays on Practical Education*, vol. i., chap. ii.; Arthur Sidgwick, *Stimulus* (Cambridge University Press). The subject is dealt with also by G. Compayré, *Cours de Pédagogie*, leçon v.; Beneke, *Erziehungs und Unterrichtslehre*, 4th ed., vol. i., § 19; Th. Waitz, *Allgemeine Pædagogik*, vol. i., § 23; and T. Ziller, *Allgemeine Pädagogik*, §§ 25, 26.

CHAPTER VIII.

PERCEPTION THROUGH THE SENSES.

First Stage of Elaboration of Sense-Data : Perception. We have now taken a survey of our sense-material and of that fundamental process of attention by which this material comes to be appropriated by the mind. It remains to show how this material undergoes elaboration by being acted upon by the functional activities of intellect, *viz.*, Discrimination, Assimilation, and Associative Complication or Integration (see above, pp. 47, 48). The first result of the conjoint working of these functional activities is known as sense-perception or perception through the senses. A child may be said to perceive as soon as he begins to distinguish and recognise objects, such as his mother's face, or the singing of the bird in a cage.

Perception is a true process of cognition, an intellectual apprehension of something as an object, and as such it must be carefully distinguished from a mere sensation. An infant receives sensations, that is to say, has its sensational consciousness modified, as when a sudden noise strikes its ear, before it is able to gain distinct knowledge by means of this sensational change, and to apprehend its external source or the object which causes it. The earlier state is one of passive receptivity, the later

of activity, in which the dawning intelligence reacts upon, distinguishes and interprets the sensational effect, or what is commonly called the sensation.

When the process of perception is completed, and a child directly apprehends an object, as in distinguishing his mother's face among other visible objects, he is said to have a Percept. The term percept means in psychology the product of perceptional activity. It is the name for a conscious apprehension of an object by way of one of the senses.

How Percepts are Reached. The seemingly simple act of distinguishing the presence of a particular object, as in seeing an orange, or hearing a bell, is the result of a process of learning. In the first weeks of life an infant gives no evidence of recognising the external source of the sounds that strike on its ear. It has not learnt to recognise the direction of a sound, as is clearly shown by its blank, wondering look, and the absence of a proper movement of the head and eyes in the direction of the sound. Still less is it able as yet to refer the sound to a particular object, its mother, and to recognise this last by means of the sound.

The process of perceptional apprehension appears to fall into two divisions. (*a*) First of all, the sense-data must be differentiated from other sense-data presented at the moment. Thus in perceiving the sound of a bell, a child must, by help of the selective direction of attention, dealt with in the last chapter, discriminate or distinguish this particular sound from other accompanying sounds. The auditory sensation must have taken on for the child's consciousness a distinctive character of its own. It is obvious, further, that along with this dis-

crimination or sense of something different from other sounds, there must go assimilation or recognition. The child must have a sense of the familiarity of the sound, of its being similar to sounds previously heard. (*b*) Secondly, in the perceiving of this particular sound as that of *a bell* the child evidently shows that he mentally connects the present auditory sensation with other sense-experiences. For a bell as a material object is known not to the sense of hearing but to the senses of touch and sight; and mentally to refer a sensation of sound to this object is to go back, so to speak, more or less distinctly on these other experiences of handling a bell and looking at it.

The first part of this process may be called *the mastery of the sense-data* themselves; the second, *the interpretation of the sense-data.* Thus in looking at a natural object, say a tree, I first of all master by successive acts of attention, discrimination and assimilation the complex visual sensations which I receive from it, the several impressions of light and shade and of colour composing the visible appearance, and then interpret this complex group by bringing to bear on it what my former experience tells me of it, for example, that that long dark patch is a trunk, having a hard and rough surface, and so forth. All this is carried out with extraordinary rapidity, so that it is hard at first for the student to believe that his mind goes through any such process. In early life, however, it is pretty certainly much slower.

(*a*) THE MASTERY OF SENSE-DATA: DISCRIMINATION AND ASSIMILATION OF SENSE-IMPRESSIONS. From what has been said it is evident that our ability to distinguish and recognise objects depends upon and directly varies

with our ability to discriminate and assimilate our sense-material.

Taking discrimination first, we see that until an infant begins to attend selectively now to this, now to that, sensation of touch, of hearing, and so forth, the outer world must remain for its consciousness a confusion, a chaos, if it can be said to exist at all. We have reason to suppose that at the beginning of life the many stimuli which play on the infant's visual organ fail to excite distinct impressions. A child lying in its cot may receive a number of visual impressions from this, that and the other object in its field of vision, but these impressions are at this stage nothing but a confused blur. Thus its consciousness reaches no clear characteristic impression of the red of the fire, of the yellow of the gilt frame, and so forth. At most there is at this stage a vague discrimination of the luminous or bright from the surrounding dark.

As the power of adjusting and fixing the eye develops, and the child begins to attend to this or that part of the field, the impressions begin to take on more of distinctness. And with the recurrence of the same or similar fields of vision and repeated efforts of attention the discrimination gets finer. Thus, not only is the very bright distinguished from the very dark, but moderate degrees of bright and dark are distinguished, as when a faint pencil stroke on the paper is distinctively noted. Similarly qualitative differences among the visual sensations come to be gradually attended to. Thus the look of a red colour is mentally picked out as different from, say, that of a blue, and with practice finer differences, *e.g.*, that between the colour of a lemon and of an orange, are apprehended.

In the closest connection with this there is developed the power of assimilating the sense-material. As like impressions and groups of impressions recur, a child will by successive directions of attention come to recognise them as familiar. This means that previous similar impressions have in a sense persisted, or at least have left some effect behind them which enables the mind to know that it has had them before. Thus after many hearings of the mother's or nurse's voice the infant on again hearing the sound shows by its cessation from crying or by its joyous movements that it recognises the sound. Similarly it comes gradually, and as the result of repeated experiences, to recognise as familiar the group of visual impressions answering to its mother's face, to its bath, and so forth. Such recognition grows in readiness, and requires less of close attention, the more frequently the sense-material presents itself.

These functions co-operate in a very close manner. A child only discriminates impressions clearly after they have recurred again and again, and so taken on something of familiarity. This is seen in the distinguishing of the mother's voice, of the rather complex sensations of taste and touch supplied by the milk, and so on. On the other hand, the progress of discrimination enables a child to recognise more and more of his sense-material. Thus it is only when he distinguishes yellow from orange that he is able to recognise each. Or we may say that a child's recognitions remain vague until discrimination introduces definiteness of character into the sense-material.

(*b*) Interpretation of Sense-Data. In perceiving an object a child not only distinguishes and recognises a

mass of sense-material, he interprets it by a mental reference to other sense-experiences. This has been illustrated in the act of attributing an auditory impression to an object called a bell. This reference implies what may be called an associative complication. That is to say, an association has been formed between this particular sensation of sound and certain experiences of touch and sight (handling and looking at the bell), so that when this sensation recurs it tends to reinstate these experiences under the form of more or less distinct *representations*. These representations are mentally organised or integrated with the sensation into one whole, *viz.*, the perception of a sounding body. This combination of different parts of our sense-experience into a unity, *viz.*, the perception of an object, may be called a process of *associative synthesis*.[1]

This reinstatement of associated sense-experiences takes place in different ways. Sometimes that which is reinstated is of the same kind as that which reinstates. Thus if in the dark I happen in feeling for something on the table to touch the blade of a knife, this impression is supplemented by a vague tactile representation of the sharp edge. In other cases the representation is that of another kind of experience. This is most strikingly illustrated in the way in which our tactile experiences are recalled by the sensations of hearing and of sight. I go back on these experiences of touch when I refer an impression of a metallic sound to a bell or of a creaking sound to a door; I do so also, as we shall see presently, when I look at objects and recognise them to be

[1] Synthesis, as opposed to analysis (resolving a whole into its parts), means the combining of parts into a whole.

material bodies, with what I should know, were I to touch them, to be rough or smooth surfaces, and so forth.

Special Channels of Perception. The sensations of each of the senses tend to recall the other sensations of the whole experience-group to which they belong, and by help of such reinstatements the mind is able to refer them to the unity of a single object. Thus a child refers his sensations of smell to objects, as when he says, "I smell apples," just as he refers sensations of light and colour to objects, as when he says, "I see a candle". Nevertheless, when we talk of perceiving objects we generally refer to the knowledge of them gained at the time through one of the higher senses, and more particularly sight or touch.

The reason why these two senses are thus distinguished has been hinted at in a previous chapter. We there saw that they were marked off from the other senses by having a fine local discrimination and a rich accompaniment of muscular activity and its concomitant sensations. Owing to these circumstances these two senses supply us with more varied sense-data than the other senses. In hearing the sound of a bell I only apprehend one aspect or quality of a thing: in grasping it between my two hands I mentally seize a whole group of features, *viz.*, its form (which is itself a highly complex impression), its size, its weight, its hardness, its smooth cold surface, etc.

The additional knowledge gained by means of the local distinctions among the impressions of touch and sight, and by the accompanying muscular experiences, is moreover of a most important kind. It includes first of all the knowledge of the situation in space of the object

perceived, and along with this a knowledge of its "geometrical" or space properties, *viz.*, its figure or shape and its magnitude. Secondly, it comprises, in the case of touch, a knowledge of its "mechanical" properties, *viz.*, resistance, under its several forms of hardness, weight, etc. And these properties are the most essential part of what we mean by a material object, forming the kernel, so to speak, of the meaning of the name "thing".

Touch and sight do not, however, stand on precisely the same level as channels of perception. For first of all, as we shall see presently, the knowledge of geometric properties is in certain respects fuller and more direct in the case of touch than in that of sight. And secondly, with respect to the important mechanical properties, hardness, weight, etc., our knowledge is altogether derived from touch. Hence tactile apprehension is to be regarded as the primary and most fundamental form of perception, and may be best dealt with before visual perception.

PERCEPTIONS OF TOUCH. These may be conveniently treated under two heads: (1) the abstract perceptions of the space qualities, and more especially the situation, form and magnitude of objects, and (2) the more concrete perceptions of things as wholes, such as a pebble or an orange.

The first kind of perception may be illustrated by the way in which a child, using merely the sense of touch, would learn the shape and size of a small cube, say one of his playing bricks. In this process the sensibility of the skin to pressure, its local discrimination, and lastly the muscular sense, each contributes to the development

of the percept. At first sight it might seem as if a child by merely laying the palm of his hand on one of the surfaces would get, without looking at it, a clear idea of its form and size. But this is not so. The primitive discriminative sensibility of the several parts of the skin is not enough for distinct perception. Movement and the muscular sensations which tell of the direction and the length of the movement are required. Even in later life we can get a much clearer impression of the form of a small wire oval or triangle by passing the finger tip round it than by laying it on the hand, and the difference is probably greater than this at first. A child who wants to have clear and exact knowledge of the square side of his cube must, therefore, pass the fingers about the four edges, so as to note how the movement of the hand remains unchanged along each of the edges, how long this uniform movement lasts, and in what manner it changes at each of the angles.

This detailed investigation by the *successive* experiences of movement may then be supplemented by placing the extended hand over the surface, and so obtaining through the local discrimination of the several areas of the skin acted upon a simultaneous perception of the whole. It is probable that both modes of inspecting a surface commonly combine in tactile perception. It is to be added that the clear local discrimination of the several parts of the surface of an object is developed by means of movement. It is by passing the fingers of one hand over the other that the original differences of local sensibility become clear. Thus a child learns the *meaning* of two touches, say one on the wrist and the other on the extremity of the second finger, because he has

moved the fingers of his other hand again and again from one of these two points to the other, and so *measured out* the exact relative position of each point, and the distance between them.

The knowledge of only one of the surfaces of the brick would thus be a very complex affair, and involve the grouping or integrating of many sense-elements; and the knowledge of the whole cubical form would further involve the combination and integration of a number of these groups. This aggregate of experiences would be completed by taking the brick into the two hands and so gaining a clearer idea of it as a whole, *i.e.*, a cube or block having " three dimensions " or solidity.

That in this way children are able to gain very clear perceptions of form, is seen in the fact that those who are born blind, and so receive no assistance from sight, are capable of representing and reasoning about geometrical forms. And even in the case of children who have the use of their eyes, it is probable that the first *clear* impressions of form, *e.g.*, of the bottle, of the mother's face, are gained largely by way of the exploring and measuring hands.

In apprehending the presence of a whole concrete thing, as a pebble, the group of impressions just described would be taken up into a still larger aggregate. Thus in learning what a pebble is, a child connects what he has observed respecting its form with its hardness, coldness, smoothness and weight. His knowledge of the pebble is the result of all this various sense-experience organised or unified into a seemingly simple mental product. That is to say, when he grasps the pebble all the properties, shape, size, temperature, weight, etc., are appre-

hended, though some of these are more prominent and in the foreground of his consciousness, whereas others may be only indistinctly represented in the background. Where the knowledge of an object, as in the case of an orange, involves important elements furnished by other senses (*e.g.*, colour, taste and smell), the group of tactile impressions may still suffice for a clear recognition. Thus a child of three or four will on touching an orange instantly apprehend the object as a whole, that is, recognise it as an orange. In this completed act of perception the group of tactile qualities immediately apprehended will of course stand out most distinctly, while such qualities as the colour, taste and smell will be only indistinctly represented.

Visual Perception. We all know that sight is in normal circumstances the leading avenue of perception. This supremacy is due in part to the fact that in looking we can apprehend things at a distance as well as near, and also a considerable number of objects at the same time, as the pictures on a wall, the buildings in a street. To this must be added the very important fact that when we see things we can generally tell how they would appear to the sense of touch. In other words, we are given to supplementing visual impressions by representations of what touch gives us, and may even be said to translate these impressions into the language of the more elementary experiences of active touch. Seeing is thus in part a representative process, and illustrates in a peculiar way the interpretation of one kind of sense-material by reference to other kinds.

Perception of Form by the Eye. In learning the direction and length of lines and the form and magni-

tude of objects, as they might be drawn on a blackboard, the sense of sight is developing its own mode of perception. This visual perception, it is plain, resembles the tactile perception already considered, in so far as it arises by the grouping of a number of experiences, passive and active. Thus in finding out by looking at the gable of a house what a triangle is, a child combines the experience gained in moving the eye about the contour, with the composite impression obtained with the eye at rest, by means of the local discrimination of the several parts of the retina. A nice and accurate appreciation of the linear form or contour of an object appears to imply, in the early years at least, movements of the eye along the boundary lines. It is only after such movements have been executed many times that the perception of form by the eye when at rest becomes distinct. And this means that the several distinctive local characters among the retinal sensations have acquired a more precise value.

A clear perception of any particular form, such as a cross, an ellipse, or the letter M, is the outcome of a detailed inspection of the several form-elements together with an apprehension of their relations one to another. Thus in apprehending the form of the cross the learner must perceive more or less distinctly the vertical and the horizontal arm, and observe their opposed directions as well as the way in which they are combined, their relative lengths, etc.

This perception of "flat" form, that is, as it can be represented on a flat surface, such as a blackboard, is, however, fragmentary and abstract. The forms of real objects from which a child first gains his knowledge are

those of solid bodies having what is called the "third dimension," that is to say, thickness or "depth," as well as length and breadth. When we look at a globe we perceive one part of the surface to be nearer the eye or advancing, another part to be farther off or receding. This discrimination of a solid form as distinguished from a flat drawing clearly involves the perception of the *distance* of the several points perceived from the eye.

PERCEPTION OF DISTANCE AND SOLIDITY. The Theory of Vision known as the Berkeleyan (from its author, Bishop Berkeley) teaches that the perception of distance by sight, though apparently as direct as that of colour, is in part at least indirect and acquired. In seeing an object as situated at a certain distance from us, we are interpreting visual impressions by a reference to movement of the limbs and to touch. In other words, we can only fully realise the distance of an object by traversing, either with the arm or with the whole body, the space that intervenes between us and it. Although this theory is still disputed by certain psychologists, I shall here adopt it as on the whole the more satisfactory.[1]

According to this doctrine, children do not at first see things as we see them, one nearer than another. This view is supported by the experience of children who were born blind, and afterwards obtained the use of their eyes. All objects appear to such at first as touching the eyes. Further, they cannot distinguish between a flat drawing and a solid body. It is only after a

[1] The opposed view is that a complete visual perception of space in three dimensions is possible without any aid from active touch. A short account of this theory may be found in Prof. W. James' *Psychology*, chap. xxi.

certain amount of practice in looking at things that they learn to distinguish near and far.

The development of the visual perception of distance takes place *by the use of sight and touch together.* A child finds out how far off a thing is from himself by movements of his limbs. Thus an infant sitting at a table becomes aware of the distance of an object on the table by stretching out its hands and noting how far it has to reach out before it touches the thing. When the child is able to run about, the movements of his legs supply him with a measure of greater distances, such as that between his cot and the fireplace. In carrying out these movements the eyes also are being actively employed. Thus the little explorer notes the difference in the appearance of the object to the eye when he moves nearer to it or farther off from it. He observes, for example, by means of the muscular sensations which accompany every ocular movement, that he has to make his eyes turn inwards or converge more in order to see the object distinctly when he moves nearer to it, and that it takes on more of distinct detail, and has a larger appearance; whereas when he moves away the peculiar strain of convergence is wanting, and the object grows less distinct in its parts, and also takes on a smaller or shrunk-up appearance. After many repetitions he learns to connect the experiences supplied by active touch (*i.e.*, moving the arm or the whole body and touching) with these changing effects on the eye. When the process of grouping and organising these experiences is complete, the recurrence of the proper group of visual effects at once *suggests* more or less distinctly the corresponding experiences of movement and touch. Thus

the sensation of muscular strain in looking at a near object, aided by the greater distinctness and apparent bigness of the object, serves as *a sign* which instantly tells the seer that this object is near and within his reach.

The perception of magnitude is closely connected with that of distance. The *real* magnitude of an object is only fully made known to a child through experiences of active touch, either by taking it, if a small object, into the hands, or in the case of a larger object, as a table, by walking round it, and so measuring out its circumference. All that the eye tells him is the *apparent* magnitude, which, as is well known, decreases as the distance increases. In recognising an object, say a chair, at different distances, a child has to allow for variations of the apparent size, connecting these with changes in the distance. Hence when he fails to distinguish the distance, as in looking at a ship on the sea, or the moon, he is apt to make absurd blunders as to size.

The perception of a cubical or, as it is sometimes called, "solid" body illustrates the same associative complication of experiences. Here, too, the child has to interpret his visual impressions by the aid of his past experiences and the knowledge already gained by active touch. That the eye, unaided by this experience of movement and touch, has little knowledge of solidity is seen in the fact that even an adult may easily fall into the illusion of taking a flat drawing for a solid body or object "in relief," as, for example, when looking at a skilfully shaded drawing or at the painted scenes of a theatre. The only way in which we can fully assure ourselves that an object has the third dimension of a cube is by taking it into the two hands.

The apprehension of solidity by the eye is, like that of distance and magnitude, effected by means of certain visual signs. In looking at a flat picture of an object each eye receives a precisely similar impression; but in looking at a solid object, say a book, the two impressions differ. Thus if the book is held a little in front of the face with its back towards the seer, his left eye sees more of the left cover while his right eye sees more of the right. The fact that the perception of solidity depends mainly on the presence of two unlike visual impressions is proved by the stereoscope, the two drawings of which, seen by the right and the left eye respectively, are taken from slightly different points of view, and so secure for the two eyes just that amount of dissimilarity of impression in the retinal images which is present when we look at a solid body. It is by noting this dissimilarity and connecting it with the fact of solidity as known by active touch that a child learns to recognise real objects having bulk, and to distinguish them from flat drawings.

Intuition of Things. In looking at an object, as in touching it, we apprehend simultaneously a group of qualities, synthesising or unifying these into a single whole. In other words, we have *an intuition of a single thing or object.* In this integrated mass of features and qualities we have primarily those immediately presented to sight, as the look of brightness or darkness of the object as a whole in contrast to its surroundings, the distribution of light and shade on its surface, its colour (or distribution of colours), and the form and magnitude of its surface as they appear to the eye. Along with these directly presented elements come

the partially represented elements which involve the closely organised integrations and experiences of sight and touch, *viz.*, the distance, the solid shape, and the real magnitude. With these may be taken the perception of number, as one object, two objects, and so forth, which probably involves some vague reference to the experience of handling things. A more distinct representation of touch is implied in the perception by means of sight of the surface of an object as rough or as smooth.[1] These may be called the fundamental part of our intuition of a particular object. In looking at any new object, as for instance a crystal, a child will instantly intuit or take in with a more or less distinct apprehension this group of qualities; and by noting this group he will afterwards be able to recognise the object in its completeness. Thus by noting the colour, shape, size, etc., of an orange he will be able to recognise another object as an orange, *i.e.*, as an object possessing certain other distinguishing qualities, as a particular degree of softness, a particular taste, and so forth.

Perception of Our Own Body. In close connection with the perception of external objects a child comes to know the several parts of his own body. This knowledge is clearly implied in our common references of our sensations, more especially on their pleasurable and painful side, to certain regions of the body as their seat. Thus skin sensations, as those of "creeping," are referred to particular areas of the skin, while muscular sensations of cramp or fatigue are "localised" in some limb, such as the right arm or the left foot. The

[1] The visual "sign" in this case is evidently the mode of distribution of light and shade.

deep-seated feelings of comfort and discomfort connected with varying conditions of the vital organs, such as indigestion, heart flutter, are also localised though in a less definite manner. Now these references to this and that part of the body are not possible at the beginning of life any more than the references of the sensations of the special senses to objects external to the body. A child has to learn where to localise his several bodily sensations; and this he can only do by coming to know something about his bodily framework and its various parts.

This knowledge, just like that of an external object, is gained by means of certain impressions of touch and sight. As we all know, an infant begins within the first months of life to examine its legs, arms, face and so on, with its hands. By frequent manual excursions over the surface of the body, the situation, shape and size of the several parts gradually become known. The eyes, too, are engaged in these early observations, so that a visual picture or "map" is gradually put together and combined with the tactile perception. One little boy was first seen to look attentively at his hands in the ninth week. All such excursions of hand and eye over the surface of the body help, as already suggested, to give clearness to the original "local discriminations" of this and that part.

While these experiments of the little hands help to develop and perfect the differences of local sensibility at different parts of the bodily surface, and so further a clearer tactile perception of the situation of objects, they serve another purpose, *viz.*, elementary *self-knowledge*. As a child learns to know about his body, he

grows aware of the fact that this body is marked off from all other objects through its close connection with his conscious life, and more particularly with his several feelings of pleasure and pain. In this way the development of the perception of the body supplies the first rudimentary idea of the "me". The tracing out of the growth of this side of the perception belongs to a later chapter.

PERCEPTION AND RECOGNITION. It is usual to distinguish the act of perceiving an object, that is, coming to know it by way of sense-perception, and the subsequent act of recognising it when seen again. And this distinction roughly represents the order of our knowledge: we first note and examine things, and then as the result of such examination we recognise things.

At the same time it is well to note that perception and recognition always go together. The account of perception given above shows that we could not see things properly so as to apprehend their qualities and relations (form, magnitude, etc.) unless we preserved the results of our past experience, and assimilated the new presentation to what we know already. *Whenever then we perceive a new object we carry out processes of recognition by assimilating its several features to what we have already observed.*

Taking the word recognition, however, in its usual sense as the identification of an object as a whole, we see that it presupposes first of all the germ of memory. A child who is able to recognise his nurse, his home, and so forth must have noted the object with adequate attention and not too long ago. This aspect of the process will be considered later on.

Assuming for the present that the past conditions of recognition have been realised, the due carrying out of this process plainly involves a new act of perception. In recognising an object, say my overcoat in a crowd of overcoats, I have to look at it and inspect it. The success of the act of recognition will depend on the closeness of this inspection. The less familiar the object, the closer of course will the inspection have to become. Objects which are well known, and which are placed favourably for recognition, *e.g.*, my overcoat on its customary home-peg, may be recognised in a semi-conscious way by a mere glance.

EARLY DEVELOPMENT OF PERCEPTIONS.

CHARACTERISTICS OF CHILDREN'S PERCEPTIONS. Our analysis of perception has suggested the way in which our percepts are gradually built up and perfected. In the first weeks of life there is little if any clear perception of outer things. The child receives a variety of sense-impressions, *viz.*, those of touch, hearing and sight, but these are not yet discriminated and assimilated ; still less are they definitely referred to the wholes which we call external objects.

The growth of perception is furthered by the gradual differentiation of sense-material, through distinct acts of attention, for example, the distinguishing of touches from tastes, one touch from another touch. Although the nervous apparatus needed for receiving distinct impressions of tone, colour and so forth is perfected within the first few days of life, it is a long time before the child's consciousness clearly discriminates one element from others, so as to be able to recognise it distinctly

when its recurs. A certain amount of repetition seems necessary to this clear discrimination.

Observations have been carried out on the way in which this discriminative ability progresses, but the results are not very definite. Different observers, experimenting on the colour-sense of the child, have come to very unlike results as to the order in which the several colours are distinguished and recognised. The observations seem to show that there is a general tendency to single out and name the reds and yellows rather than the "colder" colours, and this result if confirmed would suggest that children take more pleasure in these warm and bright or luminous colours.

The progress of discriminative attention and recognition is throughout determined in part by *preferential interest.* The child first notes and distinguishes the touches, the tastes, the sounds which he likes best, for example, the soft touch of pussy's fur, the sweet taste of sugar, the sound of the canary's song; and as a result of this he recognises these first.

The progress of this discriminative mastery of the materials of sense varies greatly among children. It is probable, as we have seen, that considerable differences of sense-capacity exist among children in the matter of colours and of tones. These original differences would of course help to determine the *whole range of improvement* possible by way of repeated exercise of function. Next to these conditions we must take into account the amount of special interest taken in the particular sense-material. Some children are much more attracted by colours, by tones, and so forth than are others. Since, too, discrimination depends on attention, it follows that

where there is more brain-energy, and consequently a more intense and prolonged mental activity, the discrimination will advance more rapidly. The effect of special exercise and training is seen in the exceptional development of discriminative and assimilative power in those who through want of a sense have had to throw more than the customary amount of mental activity into other regions of sense-experience. This is strikingly illustrated in the preternaturally keen and fine hearing and touching of the blind. The girl Laura Bridgman, who owing to an illness lost nearly all sensibility save that of touch, and was educated solely by the medium of this sense, developed a local "discrimination" of the points of a pair of compasses from twice to three times as great as that of an ordinary person, and was able after a certain amount of experience to judge with a fair degree of accuracy of a stranger's age by the *feel* of the wrinkles of the face. Such fineness of sense-discrimination is plainly due not to any natural superiority of organ, but to special attention and practice in discriminating and recognising sense-material.

Turning now to the other side of perception, that complication and integration of sense-material which underlies the interpretation of sense-impressions, we find a number of careful observations. Thus Preyer and others have noted the steps by which an infant learns to coordinate the movements appropriate to different kinds of sense-impressions and the dates at which the successive stages of progress are reached. In this way we know that four or five months may be required for learning to direct the eyes voluntarily and with precision towards objects in the side of the field, as also to reach out the

hand and grasp an object seen. That the perception of distance is still faulty at this age is seen in the fact that some time later a child will try to grasp objects lying beyond his reach. One little boy acquired a distinct visual perception of distance reachable by the hand about the age of six months.

Children's perceptions remain very imperfect during the second half of the first year, and even later. Thus the difference in look between a flat picture and a solid body seems to be discerned but very slowly. The distances of objects not reachable by the arm are apprehended more slowly than those within reach of them. The change in the look of objects as the child is carried about the room impresses him no doubt, but the meaning of these changes only becomes fully apprehended when he begins to walk, and to find out the amounts of locomotive exertion answering respectively to the different appearances of things. It is some years, however, before he begins to note with any accuracy the signs of distance in the case of remote objects.

It is much the same with the apprehension of objects as wholes. At about the age of six months a child shows signs of discriminatively recognising his mother, father, and so on, and of discerning strange faces as such. During the second half year he will learn to distinguish visually and to recognise a fair number of frequently presented objects, such as his feeding-bottle, his father's watch, pussy, the bird in the cage, and so forth. Smaller objects which are moved about, or which themselves move (as animals), appear to be noted and marked off from surrounding objects before others; and this for a double reason: (*a*) because moving things as such attract

attention and arouse interest, and (*b*) because a moving object is more easily detached by the eye from the whole visible scene, and viewed as a separate thing. Objects having exceptional brightness or lustre, or attracting by their sound, tend also to participate in this early discriminative perception. That is to say, *perception, like other forms of mental activity, develops along the lines of special interest.*

MEASUREMENT OF PERCEPTION. Experimental psychology has made a beginning at measuring the ability to perceive objects. Thus, as has been observed above, it has devised tests for measuring that important constituent of sense-perception, "discriminative sensibility" to colours, tones, length of lines, and so forth. In these experiments the aim is to ascertain the smallest difference which is barely recognisable when attention is focussed on two colours or other sense-material. The finer the difference, the higher the discrimination. Further, in connection with reaction-time experiments, it is possible to measure the interval required for *recognising* a sound or a colour. These experiments have also been carried further, and applied to simple visible forms.

Children might be further tested with respect to the rapidity with which they can discriminatively pick out a form, say that of a tree, animal, or letter from among a number of dissimilar forms.

A further mode of measuring observation, especially in its more extended and comprehensive forms, would be to set before a child, say for half a minute, a complex object, such as an unfamiliar plant or a picture of some historical scene, and see how much he can set down *immediately afterwards*,[1] either by describing or by drawing. Experiments carefully carried out would test not merely general ability to perceive clearly and rapidly, but special directions of interest.[2]

[1] The importance of this condition depends on the fact that if a longer interval elapses a more complex form of memory comes into play.

[2] A good, short account of anthropometrical experiments carried out on children's sense-capacity may be found in an article by J. M. Cattell, "Tests of the Senses and Faculties," American *Educational Review*, 1893, p. 257 ff.

EDUCATIONAL CONTROL OF PERCEPTION.

WHAT TRAINING OF THE SENSES MEANS. The training of the senses is sometimes spoken of as if it were mainly an exercise of the sense-organs, *e.g.*, the eye in readily directing itself towards and fixing an object. But this language is figurative and apt to mislead. Our analysis has shown that in order to develop the full use and function of the outer sense-organs a good deal of brain-activity must be called forth. In truth, we can only be said to train the senses properly and completely when we exercise a child in those *mental processes*, selective attention, discrimination, etc., by which the given sense-material is worked up into clear percepts.

We may, then, define the aim of sense-training as *the development of good observing powers*, that is to say, *of a habit of close and accurate inspection of things by means of the senses, and of readiness and certainty in recognising them.*

The work of exercising children in the best kind of sense-perception is a much more complex process than it at first looks. The level of what may be called natural perception, that which suffices for everyday purposes, has to be exceeded. Not only must attention be exercised in noting the finer parts of an object; a process of *analysis* must be carried out on the perceptions, so that there may be a full, *explicit* apprehension of the more important *qualities* of an object, and of the *relations* of the parts of an object one to another, and especially those which constitute its form.

The training of the senses may be said to fall roughly into two main divisions: (*a*) *the methodical exercise of*

discriminative sensibility so as to make the senses fine or acute, and (*b*) exercises in that more methodical kind of sense-perception which involves the analysis of qualities and relations, and separate acts of attention to these. We may call this last the *observation of objects,* since it resembles the process carried out in scientific observations.

(*a*) TRAINING IN THE DISCRIMINATION OF SENSE-MATERIAL. The methodical training of the senses begins with the mastery of sense-material, and more particularly with discrimination, on which, as we have seen, all fine assimilation so closely depends. The special object of this branch is *to render the senses quick and exact in seizing the precise shades of difference among the several impressions presented to them.* And the importance of this exercise in sense-discrimination depends on the fact that in proportion as we discriminate our sense-impressions finely shall we be able to distinguish and know objects accurately, and as a result of this, be afterwards able to call up distinct images of them, and to think with precision about them. The child that confuses its impressions of colour, of form, and so forth, will as a consequence be only able to imagine and think in a hazy and confused manner.

This training in discrimination may be carried out in a less systematic way in the nursery. The infant's surroundings, the toys to be handled, the picture books, even the pictures on the wall, should be chosen with a view to a sufficient variety of sense-material. Since, moreover, the object of training is to develop a clear sense of the differences among things, objects should be brought together in such a way as to present *contrasts*

in juxtaposition. The natural order of sense-development must be followed, the first differences to be brought under a child's notice being broad contrasts, *e.g.*, that of a hard and a soft material, of a blue and a yellow colour, of a high and a low tone, finer distinctions being left for a later stage. With variety should go a certain amount of repetition of impressions so that the pupil be exercised in identifying these. Hence the surroundings should not be too frequently changed. Although, as we have seen, change and novelty are valuable stimuli to the attention, a certain measure of sameness and permanence is necessary to a thorough familiarity with the various kinds of sense-material.

A more systematic procedure can be gradually introduced, aiming at a full and accurate knowledge of the several sense-elements. Thus in training the colour-sense the educator may best proceed by selecting first of all a few bright and striking colours, such as white, red and blue. Each of these must be made familiar and its name learnt. After being presented separately they should be shown in juxtaposition, so that the differences may be clearly noted. Juxtaposition or the bringing of two things side by side in space, or, as in the case of sounds, in immediate succession in time, is the most valuable instrument in exercising the senses. By seeing two colours side by side the individual character of each is made more apparent and the precise amount of difference between them is much better appreciated.

When a few elements have thus been thoroughly learned new ones may be added. In this way the child will not only add to its stock of sense-materials, but will have its former impressions rendered still more definite

by a grasp of more numerous and finer relations of difference. Thus, by adding the two colours yellow and orange to red the learner will have a more exact impression of red as different not only from green and blue, but from the more closely related colours (yellow and orange). It is to be added that a clear, explicit apprehension of colour relations as such can only be reached gradually. To classify all the various red-tints as reds, and, what is much more, to appreciate the precise amounts of difference and of similarity between colours, or, in other words, their distances one from the other in the scale of colour, is to go beyond the bare process of sense-perception and to exercise in a measure a difficult kind of *thought-activity*, *viz.*, a subtle comparison of things.

The method, here roughly described, may be said to be typical of the method of sense-training in general. Whether the educator is dealing with tones (on the side of pitch and intensity or stress), with the elements of form (straight lines and curves), or with other sense-material, as the muscular and other sensations which enter into and guide manual movements, the practising of the child in discrimination and in the simpler kind of classification implies the same general conditions. That is to say, juxtaposition is the valuable instrument throughout: broad contrasts must precede finer differences: comparatively simple presentations, *e.g.*, two tones, two form-elements, must come first, and more complex series of elements, such as two musical chords, two geometrical figures, later on: the recognition of *degrees of difference and of likeness* must come after the bare discernment of difference and likeness.

Throughout this branch of training the educator should

remember that the finer exercises in discrimination imply a special effort of attention, and are apt to be felt as a severe strain by the child. They should not, therefore, be greatly prolonged. If, however, the risk of over-exertion is avoided, such exercises may be made not only tolerable but positively agreeable. For children love activity, and activity of body and of mind is enlisted when a child is invited not only to compare colours but to select and to arrange them.

While these exercises in the finer discrimination and assimilation of sense-material are thus valuable, it is possible to over-rate their value. This Rousseau seems to have done in his conception of a boy exercised by daily practice in the finer discriminations and detections of the savage, and able to distinguish objects in the dark by the sense of touch with something of the skill of the blind.[1] It has been remarked that civilised men are less dependent on fine sense-capacity than savages and the lower animals. As Isaac Taylor says (*Home Education*, chap. iv.) : " It is to the savage, or it is to men exercising special callings of an inferior sort, that there can be much benefit in having the senses sharpened to an extreme acuteness ". To devote a considerable amount of school-time and effort to raising discriminative power above what may be called the normal level would certainly not be wise. The claims of the higher work of intellectual instruction do not allow of this.[2]

[1] See what he says on the advantages of games in the dark, *Emile*, livre ii., p. 128 *sqq.* (edition of Garnier Frères).

[2] Compare what is said by W. H. Payne, *Contributions to the Science of Education*, pp. 27, and 81, 82.

(*b*) Training in the Observation of Things. We may now turn to that fuller process of training which has to do with a full, accurate and orderly way of inspecting things. This is best marked off as *Observation.* The object of this training is to exercise the child's mind in a full explicit apprehension of the whole object by a clear grasp of its parts, qualities and relations. It involves exercises of *thought*, properly so called, *viz.*, the *analysis* of objects so as to grasp their qualities and relations, and the supplementary process of *synthesis.* We have seen how a child spontaneously synthesises a mass of sense-material when he forms his percepts. Yet this process is carried out very largely in a sub-conscious way, and does not involve a clear apprehension of what we call the qualities and the relations of an object. We have now to see how by the aid of methodical training he obtains such a clear apprehension of an object as being made up of certain qualities and relations.

Exercises in Methodical Observation of Form. In order to illustrate this training in explicit, clear observation, we may take what is of greatest importance for knowledge, the *form* of an object. Many children, at least, have only a very shadowy idea of the form of a spoon, of a cage, of a horse, and so forth. They seem to apprehend the whole scheme in a vague way—say the general look of a horse as determined by the juxtaposition of the head, neck, body and legs—but they have no clear apprehension of the shape and size of these several parts, or of their relations of position and of magnitude (proportion) one to another. This seems to be illustrated by their uncritical acceptance of very rough and even inexact drawings of familiar forms, such as

those of a man, a horse, and a tree. When they attend to certain details which particularly impress them they are apt on this very account to fall into a one-sided, fragmentary way of looking at things, as when a little boy of two called a bronze statue of a stork "gee-gee" (horse), apparently on the ground of its possessing a long neck like the horse. Their descriptions of what they have seen appear too by their vagueness and their one-sidedness to point to the same conclusions. The same remark applies to the perceptions of objects through the sense of touch. A child may get a total tactile apprehension of an orange when one is placed in his hand, and yet have no clear apprehension of the roughness, softness and other qualities of the surface.

Of course asking a child to give an account of an object is not conclusive as showing that he has observed badly: his memory or his command of language may be at fault. So the rudenesses and inaccuracies in children's drawings may be due to want of technical resources, the ability to draw lines and to arrange these in the required way. Yet I believe that the facts show, after allowing for the action of other causes, a good deal of vagueness in ordinary childish perceptions. This is not inconsistent with the fact that in certain directions where interest is strong children's observation is often close and fine (see my *Studies of Childhood*, pp. 66 ff., and 393 ff,).

From the rude *implicit* mode of apprehending form we may distinguish the *explicit* apprehension of form as a group of related parts. A child only obtains a clear cognition of the form of a human face when by separate acts of selective attention he analyses the whole form, inspecting this and that feature, noting their several forms and dimensions, as also their relations of place and magnitude or proportion one to the other. This methodical apprehension of form must of course be

led up to gradually. Younger children should be encouraged to inspect the forms of things for themselves, both with eye and with hand, and to find out all that they can before being taken on to the more regulated exercises.

The more important principles which govern this early department of training appear to be the following: (1) A complete and perfectly distinct perception of form involves not merely passive sight and touch but the active movements of eye and of hand. Hence the importance of fairly large outlines, which invite the eye to excursions. Hence, further, the great educational value of all manual constructive work. Such constructive work, whether in building a bridge with bricks, forming a square by sticks, or drawing a house or a duck, owes a part of its educative value to the fact that it translates what is seen (the model form) into a series of muscular movements, each of which issues in the production of a certain form-element. It thus secures in the most efficient way *attention to details*, and a clear analytic perception of the parts; while by developing the complete form by gradual stages it supplies at the same time the conditions of a firm synthetic apprehension of these parts together, as related one to another and forming a whole.

(2) The observation of form should be developed conformably to the general laws of mental development. Thus it should pass from an indefinite and incomplete to a definite and complete stage. A child should first of all be led to see the general character of the form of a horse, or a bird, and then be taken on to observe the finer details. In like manner it should begin with the simple and then

go on gradually to the complex. It would be absurd to set as an exercise to young children the examination of a highly complex form as presented in architecture, or in a mechanical contrivance. The kindergarten gifts and occupations clearly satisfy these conditions in general. Froebel in his methods of educating a child in the knowledge of form recognised with a fine psychological insight the fundamental importance of touch, and the organic connection between the perception of form and the expression of the idea of form by manual construction.

Exercises in the apprehension and manual reproduction of lines and what may be called abstract forms, such as the square, should be supplemented by a training of the observing faculty in the discernment of natural, and, generally, of concrete forms. From an early period a child is interesting himself in the forms of common objects round about him, such as animals and ships, and he should be exercised in a more close and exact observation of these more concrete forms. As we have seen, children naturally observe at first only the more salient features of an object, such as the tallness of the poplar, the long curve of the swan's neck; hence the educator has to correct these early defects and to practise the observer in an impartial attention to all parts of the object, and to the minuter details of form.

Here, again, the hand should be called in, in order to reproduce what is seen. It is by the well-known kindergarten occupations, such as clay-modelling, paper-folding and drawing, that the perceptions of form become clear and exact. Of these Drawing, as an exercise of special educational significance, claims a word or two here

The child's spontaneous impulse to imitate nature by Drawing is one of the most valuable ones to the educator.[1] Along with such occupations as building with bricks and modelling, drawing involves no doubt a measure of abstraction, since it separates off, so to speak, the visible aspect of form from the concrete tangible reality. Accordingly it is best taken up after some progress in these exercises. The process of drawing, by compelling eye and hand together to reproduce the model-form, serves, in the way already explained, as the very best means of securing a full, detailed, *explicit* knowledge of all that is comprised in a form under its bi-dimensional or visual aspect.

It follows that a child who has become skilful in drawing has not only acquired a useful manual art, but may be said to have more fully developed his power of *seeing*.

The two sides of the training in the observation and manual reconstruction of form here distinguished should be carried on together, and be made to help one another. The superior interest of concrete forms, especially those of living things, makes it desirable to deal with the simpler of these in the earlier stages. A child of three will take pleasure in copying the drawing of a duck, but would hardly be able to give attention to the abstract form-elements, straight lines, etc.[2] Yet as soon as this

[1] Froebel well illustrates the spontaneous tendency of a child after passing his fingers along the edges of a table to draw the forms (*The Education of Man*, § 36). The characteristics of children's spontaneous drawings are fully dealt with in my *Studies of Childhood*, chap. x.

[2] The desirability in the educational control of drawing of setting out with the concrete forms which children draw spontaneously is well urged by Mr. H. T. Lukens, in his "Study of Children's Drawings," *Pedagogical Seminary*, vol. iv. (1896), p. 79 ff.

more abstract mode of attention is possible it should be required. In drawing a house, for example, a child should be led to note the inclination and length of the lines, the bluntness or sharpness of the angles, and so on. Even in dealing with the forms of living things, simple geometric schemes—as the oval for the body and the oval or triangle for the head of an animal—may with advantage be introduced as at once aiding the execution and giving explicit definiteness to the forms dealt with.[1]

THE PRINCIPLE OF THE OBJECT-LESSON. Next to this exercise of a child's mind in a clear perception of form comes the training of it in the observation of objects as wholes, as made up of definite groups of qualities. The systematic development of this side of the training of the senses leads to the Object-lesson. By this is meant, strictly speaking, the presentment to a pupil or class of pupils of some object—whether natural substance, as a piece of coal, some organic structure, as a whole plant or part of the same, or, finally, some product of human industry, as a woven fabric—in such a way as to secure a detailed examination of its properties by the several senses. With this there commonly goes some exhibition of the capabilities and uses of the object, and some reference to its origin and history.

It is evident from this general description that the object-lesson aims directly and primarily at exercising a child in full and accurate observation by way of the several senses, and in the synthesising of such detailed observations into a clear and adequate total observation. Hence it falls naturally into two parts: (1) the detailed

[1] On the educational principles underlying drawing, the student should consult H. Spencer, *Education*, chap. ii.

exposition and naming of the several parts, qualities, and relations of the object; and (2) the summing up of the results in a verbal *description* of the object.

As a methodical training in a full and impartial observation of objects, this form of instruction supplies a fit introduction to the study of those physical sciences, such as botany, where accurate observation is the main thing. Its value under this aspect will obviously depend on the extent to which the observing powers of the class have been made use of. So-called object-lessons in which a thing or its model or picture is shown and then a verbal lesson on it unfolded cannot, it is evident, supply the methodical training of sense-observation just described.

While, however, an object-lesson may thus be regarded as an exercise in pure observation, it always includes other elements as well. It has been pointed out that the explicit mental grasp of the qualities and relations of an object implies a certain amount of thought-activity. It exercises a child's mind in analysis and what is called "abstraction," processes to be dealt with at a later stage. Not only so, a clear mental apprehension of the qualities of an object involves a juxtaposition of the object with other objects, and a process of *comparison*. This applies with special force to the explicit apprehension of one of *two opposite or contrasting qualities*, *e.g.*, heavy and light, transparent and opaque, agreeably to the well-known logical dictum that the knowledge of opposites is one.

It follows that the object-lesson is preparatory to scientific study in more ways than one. Thus it requires something of that analysis of objects, of that separate or abstract consideration of their several qualities, relations

of form, etc., which gives to scientific investigation its clearness and exactness. Again, it may be made to include the beginnings of scientific Classification and Definition. In a good object-lesson, say on a leaf, a step is taken towards a *general conception* of the class "leaf," and a definition of the common structure and function of leaves.

The object-lesson, properly so called, aims primarily and mainly at the training of the observing powers themselves in a clear mental apprehension of the particular qualities and relations of this individual object. It only indirectly seeks to develop as an after-result clear *ideas* about things. Its purpose is realised when the object has been accurately inspected by the methodical analytical process explained above, and its several properties and relations clearly apprehended. In this respect it is marked off from all appeals to the senses which are intended to subserve directly the better imagination and understanding of subjects that are being dealt with at the time largely by way of verbal instruction. Such appeals to the senses have a high educational value, and ought indeed to be made through all the stages of instruction. Thus a geographical description is made real, that is to say, the country described is far better imagined, after a look at a good model or a good map.

While the teacher may thus do something towards training a child's powers of observation, it is not to be forgotten, however, that the most efficient way of developing them lies outside the range of the recognised school exercises. A habit of close and exact observation of nature is best acquired in friendly association with, and

through the sympathetic spell and guidance of, an observant parent or tutor in hours of leisure. A walk in the country or a visit to a museum or a picture gallery with a good observer, with whom the pupil is in sympathetic *rapport*, will probably do more in awaking interest and in exciting the mind to close and accurate observation than the most elaborate school exercise. The training of the observing powers is indeed that part of intellectual education that most requires the aid of other educators than the schoolmaster. And one evil resulting from our modern aggregation into big towns, and the growing demands of our schools on the time and the energies of children, is that so little opportunity and capability remain for those half-spontaneous beginnings in the observation of nature, the noting more especially of the forms and colours, together with the modes of movement, of living things, which supply the best exercise in careful observation during the years of childhood, or for those more active occupations, such as collecting birds' eggs, insects and the like, which, while half-spontaneous and growing out of the boyish love of roaming and exploring, are the beginning of a truly scientific interest in natural objects.

Just as perception by methodical training can be developed into this clear grasp of qualities and relations, so can recognition. In truth, the methodical object-lesson should be followed up by a series of exercises in explicit recognition, that is recognition by a clear apprehension of decisive marks or "criteria". The amount of mental activity thrown into the first observation will be tested by the readiness and accuracy of the recognition and the ability to pick out and describe the marks by

which the recognition has been carried out. This applies both to the identification of one object, say a particular fossil, and to that wider recognition of class-membership or classification which grows out of observation, say, the recognition of a new specimen of a class of fossil.

REFERENCES FOR READING.

A fuller account of the process of Sense-perception may be obtained from the following: Sully, *Outlines of Psychology*, chap. vii. (or the corresponding chapter in *The Human Mind*); J. Ward, article "Psychology" in the *Encyclopædia Britannica* (9th ed.), "Perception," p. 51 ff.; W. James, *Psychology*, chaps. xx. and xxi.; and E. B. Titchener, *Outline of Psychology*, pt. ii., chap. vii., §§ 43-46. The explicit form of Perception ("Perception of relations") is specially dealt with by Lloyd Morgan, *Psychology for Teachers*, chap. iv.

The early developments of perception are traced out by W. Preyer, *The Senses and the Will*, pt. i.; B. Perez, *First Three Years of Childhood*, chap. iii., sect. ii.; and G. Compayré, *Intellectual and Moral Evolution of the Child*, chaps. iii. and iv.

The bearings of principles on the training of the senses and the observing powers are discussed by H. Spencer, *Education*, chap. ii.; A. Bain, *Education as a Science*, chap. iii., "Discrimination," p. 15 ff., and chap. viii., "The Object-Lesson," p. 247 ff.; G. Compayré, *Psychology applied to Education*, chap. iv. The reader of German may further consult: Waitz, *Allgemeine Pädagogik*, "Die Bildung der Anschauung" (§§ 7-10), and the article "Anschaulichkeit" in Rein's *Encyclop. Handbuch der Pädagogik*.

CHAPTER IX.

REPRODUCTIVE IMAGINATION.

Process of Reproduction. The senses are the source of all our knowledge about external things, *viz.*, their several qualities, their local relations, their movements, and so forth. Yet it is evident that if we could only observe objects by way of the senses we should gain no genuine knowledge. Perception is a temporary and uncertain phenomenon depending on the actual presence of an object to the senses: true knowledge of things is an enduring possession, which we can make use of at any time, whether the objects are before us or not.

This persistence of the "impressions"[1] which objects make on our minds through the senses is commonly ascribed to a fundamental property or functional aspect of mind, *viz.*, Retentiveness. This property, as was pointed out in an earlier chapter, is connected with a supposed physiological property, *viz.*, the setting up in the various structures of the brain of permanent "functional dispositions" corresponding to their respective modes of

[1] The term impression or sense-impression as used in this chapter must be understood to mean the whole sense-presentation, as, for example, the total visual phenomenon making up the appearance of an orange. Also, unless otherwise stated, the term implies the reaction of the mind on the sense-material and the development of a complete percept.

activity. Thus the particular kind of activity of the visual centres involved in looking at an object, say a person's face, leaves as its after-result a lasting "trace" in the shape of a "psycho-physical disposition" or tendency to renewed action, which, when favourable conditions (to be specified presently) are added, may result in the recalling of the impression, or, to speak more scientifically, in the appearance in consciousness of a memory-image of the object (compare above, pp. 68, 74).[1]

This setting up, by means of the repeated action of sense-stimuli, of a later independent activity in the brain is strikingly illustrated in the case of one who, like Milton after he became blind, or Beethoven after he became deaf, has lost a particular sense and yet is able to go on having vivid and distinct memory-images corresponding to the lost group of percepts.

It must be clearly understood that the name retentiveness is merely a convenient way of describing the fact that after the occurrence of sense-percepts memory-images tend to arise. All our talk about lasting impressions stored away in the mind is highly figurative, and apt to mislead. Our minds are not material objects like boxes, capable of receiving and holding things. We know nothing of mind save its several functional activities. The word retention has no meaning save in relation to the processes of reproduction, that is, the emergence in consciousness of memory-images.

Representative Images. Whenever we recall what

[1] It is a question whether the memory-image involves merely a new mode of activity of the same nerve-centres that were engaged in sense-perception, or whether it presupposes the development of higher nervous structures closely connected with the perceptional centres.

is no longer present to the senses the process is called Reproductive Imagination, since we have a mental image,[1] which may be said to reproduce in an altered form the original percept. It is also spoken of as Representation, *i.e.*, the *re*-presenting of what was before presented, and the mental image by means of which we carry out this representation is called a *representative image*. Thus in recalling the look of our absent home or of our friend we may be said to see with the "mind's eye" the object we originally saw with the bodily eye.

In thus speaking of reproductive and representative imagination we must not be led into the error of thinking that a memory-image is a complete pictorial copy of a sense-percept. It does no doubt serve to call up a kind of pictorial substitute for the original sense-presentation. When we picture a beautiful old mansion that we have lately visited we represent it as it actually presented itself to our eyes, with its proper shape and style of architecture, its colouring and surroundings. Yet our images are as a rule much less complete and distinct than our percepts. In recalling, for example, the face of an old friend we do not ordinarily represent in sharp distinctness all its features as they would actually appear to us if the person were present. Indeed, the researches of Mr. F. Galton as to people's power of "visualising," *i.e.*, calling up distinct and complete mental pictures of familiar objects, go to show that very few of us have the power of fully and distinctly imaging even

[1] The reader should note that although the word (mental) image refers most naturally to visual or pictorial representation, it includes other representations, such as that of a tune.

so well known an object as our breakfast-table, with all its details, including their colours as well as their forms.

As was pointed out in the last chapter, an element of representation, of a vague character at least, enters into the process of perception itself. In looking at a spherical body, say a cannon-ball, we are reproducing more or less distinctly certain tactile experiences. And in the fuller process of recognition, as when we discern our house, or a friend's figure, we are recalling something at least of our past percepts of this object. In this case, however, we have to do with only a rudimentary process of reproduction. In recognising a friend I do not distinctly call up an image of his appearance when I saw him before. All that really takes place is the occurrence of a sense-percept, with the added sense of familiarity, *i.e., the consciousness of having had a like percept* before.

The representative image only takes on a distinct and complete character when neither the object represented, nor one closely resembling this, is present to our senses. Here imagination or ideation becomes detached, so to speak, from sense-presentation. In imaging a country-scene when sitting in a room in a London house looking out on nothing but houses, cabs, and the like, I mentally realise my object *wholly* by means of a representative image.

This region of pure representation answers to the more important part of what we commonly call Memory. To remember, in the complete sense of the word, is to be able to represent an object or an event by means of a memory-image or a succession of such images. In acquiring any knowledge, *e.g.*, that of the appearance of an ob-

ject, of the name of a thing, of a tune, or of a historical fact, we have to develop clear and easily revived representative images. In learning through the medium of verbal instruction, whether oral or written, a child has to develop certain images or "ideas" by processes to be considered presently; and these ideas have to be made persistent, that is, recurrent. Even the more abstract kind of knowledge, say that of grammar, has to be permanently retained by means of such recurring representations, in which verbal images (images of words) play a prominent part. The understanding of the nature of the processes of reproduction is thus seen to be a matter of special interest to the educator.

CONDITIONS OF REPRODUCTION. The most general condition of Reproduction is a certain degree of *recency* of the original impression. We readily call up an image of an object presented in the adjacent past, such as that of the appearance and the voice of the person we have just been speaking with. After longer intervals of time our sense-presentations are, as a rule, less easily recalled. The longer the interval between the presentation and the representation, the less distinct in general will be the image. The series of images of verbal sounds and articulatory movements answering to certain lines of poetry which a child can call up a few minutes after repeating these lines aloud will grow indistinct, if revivable at all, after an hour or a day. The scenes and the experiences of our remote past are for the greater part lost to us.

Coming now to more special conditions, we may say that the capability of representing an object some time after it has been perceived depends on two chief circum-

stances. In the first place, a sense-presentation must attain a certain degree of psychical force or "impressiveness". This circumstance may be described, figuratively, as the *depth* of the original impression, or, more accurately, as its dynamic character when it became a new element in consciousness.[1] In the second place, there is needed the presence of something, either a sense-presentation or the corresponding image, to "remind" us of the object or to *suggest* it to our minds. This second circumstance is known as the force of Suggestion.

(*a*) DEPTH OF IMPRESSION: ATTENTION AND RETENTION. In the first place (assuming that there has been only a single perception of an object) we may say that a distinct image presupposes a degree of perfection in the original percept. This again means, first of all, a certain *sufficiency of sense-material*. Thus the appearance of an object properly illumined and favourably placed for distinct and complete perception will be recalled better than a presentation wanting in these advantages, such as that of an object indistinctly seen. The perception of a chalk diagram on the blackboard has its dynamic character raised by the contrast between the whiteness and the black background. For a like reason actual sense-presentations have in general more "impressiveness" than the products of imagination. It is a familiar fact that children will recall the appearance of a place they have seen better than one that they

[1] The student must beware here of the misleading suggestions of popular language. The mind is not a material substance like wax, capable of receiving the "stamp" of an external object. As we have seen, the mind is active in perception, and may be said to construct its percepts.

have merely had described to them. The favourable effect on memory of repeating words audibly (as compared with doing so inaudibly) is explained by this principle; in fully articulating them we obtain the advantage of the actual sense-presentations, both those of the sounds and those of the articulatory movements.

The depth of an impression is, however, determined not merely by these external conditions but by the attitude of the mind in relation to it. If our minds are preoccupied, even a powerful sense-impression, such as that of a costermonger's cry in the street hard by, may fail to develop afterwards a distinct image. Hence under the dynamic character of impressions we must include as a second and even more important condition *the degree of interest excited* by a sense-presentation *and the corresponding closeness or intensity of the act of attention.* This principle is strikingly illustrated in the effects of strong feeling, whether agreeable or disagreeable. When a boy on receiving sense-presentations is deeply affected by feeling, as in listening to an exciting story or in watching a cricket match, he will afterwards remember distinctly. Such intensity of feeling by securing an exceptionally vivid interest and close attention ensures an unusually full play of the intellectual functions. Thus, the boy deeply interested in watching a cricket match discriminates the several individual players, their places in the field, the characteristics of their play, etc. It seems to be generally allowed that this fineness of the discriminative process is one of the most important determining elements in the "retention of impressions".

The interest determining the force of attention may, as we have seen, arise directly out of some stimulative

aspect of the object, as the novelty or oddity of a person's dress, or out of its relation to our previous presentations, as when a child listens to talk about nurse, or about himself. A pleasurable feeling of moderate intensity immediately excited by the perception itself appears to be the state of mind most favourable to a mastery, at once quiet and enjoyable, of what is presented. Here, again, the boy observer in the cricket field (who is not too excited by partisanship) may serve as an illustration. It is the state of mind which the wise teacher seeks to produce in his pupils' minds.

Finally, it is to be observed that our minds are not always in an equally favourable state for the "taking on" of new impressions. The probability of the retention of a clear mental image varies directly with the degree of mental or cerebral vigour at the time of the presentation. A well-recuperated condition of the brain, such as is realised after a period of repose, is highly favourable to a "deep" or lasting impression.[1]

Repetition and Retention. We have so far assumed that the mental image produced is the result of a single sense-presentation. Yet one presentation rarely suffices for a lasting retention. Since every impression tends to lose its effect after a time, our images require to be re-invigorated by new or *repeated* presentations of the object. Most of the events of our life, the places we have seen once and hurriedly, the talk of our friends, and so on, are forgotten just because the presentations

[1] Professor Bain considers that the acquisition of new impressions is of all forms of intellectual activity that which involves the largest consumption of brain-force (*Education as a Science*, p. 23).

never recur in a precisely similar form, and so get no support from repetition. Here, then, we arrive at a second main circumstance determining the memory-products of our sense-presentations. *Our images tend to grow, in distinctness, completeness, and in readiness to appear, with the number of repetitions of the sense-presentations.* Where the repetition of the presentation itself is impossible, the renewed reproduction of it may serve, even though less effectually, to bring about the same result. Thus by recalling in talk with a friend some experience in which we have shared, the memory-images are kept alive. Repeating verses inaudibly helps to some extent to preserve the memory of them.

Such repetitions in order to be effectual must be sufficiently close together in time, or *frequent.* In learning a new language we may look up in a dictionary an uncommon or rarely occurring word a considerable number of times and yet fail to gain a firm hold on it, just because the repetitions are not frequent enough; whereas if the word is an oft-recurring one a smaller number of references to the dictionary will suffice. This is only one case of the importance of recency of impressions. The memory-effects of single presentations tend after a little time to fade away, so that the reinforcing aid of new presentations is needed. The process may be likened to that of damming a stream with stones. It is only when we throw in the stones with sufficient rapidity that we have a chance of establishing a barrier. After a sufficient amount of repetition, other circumstances being favourable, the image, like the dam, becomes set, so to speak.

While repetition is thus an important condition of retention, its importance can easily be over-rated. Each new repetition of a sense-presentation does not produce the same advantageous effect. Recent experiments have shown that in memorising verbal material, such as a series of nonsense-syllables, the first repetition effects more than any subsequent one.

These two conditions, interest and repetition, take the place of one another to a certain extent. The more interesting an impression the fewer the repetitions necessary to get it permanently set. This is illustrated in the words of Juliet on hearing Romeo's voice:—

> " My ears have not yet drunk a hundred words
> Of that tongue's utterance, yet I know the sound ".

On the other hand, the more frequently an impression recurs the less will be the degree of interest required for producing the desired memory-effect. As has been humorously observed, even matters of such little interest to us as the fact that " Mr. G. sells Eureka shirts " stamp themselves on our memory after they have been repeatedly forced on our attention by a sufficient profusion of advertisements.

Nevertheless it remains true in general that for the development of clear images both interesting presentations and a certain frequency of repetition of these are necessary. This certainly applies to the larger part of school acquisitions. In the case of most children, at any rate, interest in the forms of words, and even in geographical and other facts, is rarely so keen as to allow the teacher to dispense wholly with the valuable auxiliary of repetition. On the other hand, no number of repetitions of a lesson will avail if the pupil takes no interest in the subject, and his thoughts wander. To

this it may be added that a mechanical repetition of any subject-matter, without any variation of form or mode of illustration, tends to repel the mind, drying up the springs of interest, and inducing an inattentive, sleepy condition of mind highly unfavourable to retention.

(*b*) SUGGESTION OF IMAGES, AND ITS CONDITIONS. When an impression has, with the aid of the above favourable conditions, been well fixed in the mind there remains a psycho-physical *disposition* or *tendency* to a conscious revival of it under the new form of an image. Having, for example, gone to Kew Gardens and made a careful observation of some tropical plant my psycho-physical organism may be said to have become capable of producing an image of this plant. The degree of perfection with which we represent any object depends ultimately on the strength of this disposition. Yet the mere disposition will not of itself suffice to bring about (after a certain time has elapsed) a distinct memory-image. There is needed further the presence in consciousness of some other presentation or image which *suggests* the image. Thus the sight of a place on a second visit reminds us of some interesting occurrence which happened there during the first visit. The reason why we forget so many incidents of our past life, including those dream-experiences which are wont at the moment to be so deeply interesting, is that there is nothing in our present surroundings which is fitted to excite the corresponding images.

In the illustration just given the suggestion is seen to be the result of *association*. The renewed presentation of a particular locality calls up the image of the event, because in the original experience place and occurrence

were presented together and became mentally connected or associated. In order to understand the process of suggestion we must therefore make a somewhat closer study of this connective work of association.

LAWS OF SUGGESTION.

(I.) SUGGESTION AS THE RESULT OF ASSOCIATION: LAW OF CONTIGUITY. The process of Association has already been touched on in connection with sense-perception. There, however, we had to do with the organising of a mass of sensation and representative element into the unity of a percept. Here we must study the "association of ideas," as it has been called, that is, the process by which the separated wholes which we call images of things are introduced into consciousness.

The principle whose working we have to examine is commonly known as that of "contiguous association" or Association by Contiguity. By the name contiguity is here meant that the mental connection established is based on the nearness or adjacency in time of the original presentations. The Law of Contiguity may be stated briefly as follows: *Presentations and, more generally, experiences, which occur together, or in immediate succession, will afterwards tend to suggest one another under the form of memory-images.*[1]

This Law of Association has, as already pointed out, its physiological basis. In many cases, at least, we know that the associative connection of presentations, *e.g.*,

[1] The introduction of the more comprehensive term "experiences" here is intended to show that our feelings and actions, as well as our intellectual presentations, are subject to this law. This will be illustrated later on.

that of the sound and the articulatory movement which enter into speech, involves the formation of nervous paths of connection by way of the so-called associative fibres in the brain. The fact that associations are so much more readily built up in the early years of life illustrates this dependence of association on the growth of nervous connections (compare above, p. 35).

The principle of Contiguous Association is illustrated throughout the process of acquiring knowledge, whether from the direct inspection of things or by way of others' instruction. So universal is its action that it is difficult to select illustrations.

We may bring the more important varieties of contiguous association under the following heads: (1) First of all, we have simple and obvious cases of *time-connection*, that is to say, the effect of simultaneity or close succession among presentations and experiences; *e.g.*, the association of the sight of a bell swinging with its sound, of the shining of the sun with the feeling of warmth, of one bit of a tune with the preceding and the succeeding bit. Among these successions one important class is that of the *recurring sequences* which make known to us the connection of events as causes and effects. Thus a child comes to know that the sun warms, that rain wets, that hard bodies hurt, that his own actions remove obstacles, and so forth, by noting how certain experiences regularly follow their proper antecedents.

(2) Another group may be described as *object-associations*, *viz.*, the association of objects with their less obvious properties and their uses. A child by repeated experiments learns to connect the properties of divisibility and combustibility with wood, the property of

transparency with glass, the characteristic modulations of voice, the gestures, etc., of a person with the sight of this person, the pleasure of throwing and rolling a ball with the appearance of the ball, and so forth.

(3) Our next group of connections consists of *local associations* or associations of place. These play an important part in memory. They include (*a*) connections of objects with places, *e.g.*, the canary with its cage, say, near the window, cowslips with the fields, books, toys, and the like with the places where they are put away and kept; (*b*) of events with places, such as the meal, the lesson, and so forth, with the room in which they take place; and (*c*) objects and features of the environment with others which are contiguous in place, *e.g.*, the sea with the sandy shore, a bridge with the river it crosses, one house or street with the adjacent one.

(4) A class of connections deserving especial mention is that of *Verbal Associations.* By this expression is meant the connecting of names and words generally with their meanings (ideas of objects, qualities, relations) and the linking on of one word to another in a verbal series, as in learning to say "one man," "two men," as also in committing verses and the like to memory.

Although it may be convenient thus to distinguish different groups of association, the student must note that they all alike rest upon contiguity or adjacency in time. Thus the glass and the fact of its transparency are seen together *at the same moment:* similarly the sight of a person and the characteristic sounds of his voice are presented together, and the child's attention is directed to each *in rapid sequence.* Associations of place, again, *e.g.*, the cage and the window, are based upon the fact that the two form parts of one single complex presentation of sight, and that the attention can pass directly from one to the other. In like manner the child learns the meaning of a name by hearing it used at the same time that the object is presented.

It is easy to see that all learning in the teacher's sense of the word illustrates the same law. Thus in an object-lesson a child has to associate the mode of production of a substance (*e.g.*, coal) and its uses with the object. Again, in learning about distant places and about the past history of his country, he has to build up, by a process of imaginative juxtaposition or construction, to be explained by-and-by, associations between things and events like those he builds up in the course of his daily observations. Since, moreover, school-learning proceeds very largely by aid of verbal associations, *e.g.*, in acquiring the names of things, in fitting a French word to its English equivalent, in all verbal memorising of rules and the like, it is apparent that this class of association plays a large part in the work of instruction.

STRENGTH OF ASSOCIATIVE COHESION. The Law of Contiguity speaks of a *tendency* to call up or suggest. This expression implies that the suggestion does not always take place even when the suggestive presentation or idea is present, and that in some cases the revival or reinstatement is much more prompt than in others. We may easily see by observation that this is so. Thus we sometimes meet a person we know and do not recall his name, or only succeed in doing so after a prolonged effort. In other cases, again, the reinstatement of the idea is certain and rapid, as when a familiar word in one's native tongue, *e.g.*, "father," calls up the image of the object which it symbolises. In certain cases, indeed, the revival is so rapid that the mind is hardly aware of a transition to a second separate idea. This applies to the ideas called up by thoroughly familiar names, the representation of feelings called up by the presenta-

tions of the cries, facial movements, etc., which express the feelings. We describe these facts by saying that *there are different degrees of associative cohesion among our ideas.*

On what the Strength of Associative Suggestion Depends. The strength of the associative bond depends in all cases alike on the same circumstances that we found governing the persistence of impressions regarded as single or apart. These are (1) the amount of attention given to the presentations when they occur together; and (2) the frequency of their conjoint occurrence or "co-presentation".

The first condition is illustrated when a child is greatly interested in the appearance of a stranger, and notes at the same time something peculiar in his name. In such a case he in a manner makes one presentation of them, so that the recurrence of either subsequently at once suggests the image of the other. The same thing is seen when in hearing a lesson in geography or history children are called on to give special attention to relations of place or time, such as the situation of a town on a particular river, the occurrence of an event in a particular reign. The greater the force of attention thus directed to two or more things in their relations each to each the firmer will be the resulting association.[1]

In certain cases where the experiences and their occurrence together are of exceptional interest, a single co-presentation may suffice to produce a firm association. This applies to experiences having a marked "feeling-tone," as when a child connects the pain of

[1] On the nature and conditions of this comprehensive attention to a plurality of things in their relations, see above, p. 143.

being burnt with the fire. In ordinary cases, however, repetition is necessary to fix associations, as we have seen it to be necessary for developing distinct single memory-images. All our enduring knowledge about the things around us, the varying phases of earth and sky, the locality we live in, our human surroundings, and so forth, involves frequently repeated co-presentations. A child's association of flowers with their respective scents, of warmth with the sun, of a meal with its proper hour, is the result of many contiguous or co-adjacent experiences. The more frequent the conjunction of any two presentations in our daily experiences, the stronger the resulting bond of association. The peculiarly close associations already alluded to, such as those between words and the ideas they signify, the sounds of words and the articulatory movements required for producing them, are the result of innumerable conjunctions extending throughout life.

Trains of Images: Verbal Series. All that has been said respecting a pair of presentations and the resulting representations applies also to a whole series. A large number of our ideas are made up of trains of images answering to recurring and oft-repeated series of experiences. Our knowledge of a country through which we have travelled, of a tune, of a poem, as well as that of the way to do things, for example, to dress ourselves, or to write, involves a train of representations answering to the series of presentations, visual, auditory, and motor, which constituted the original series of experiences.

The fixing of such a train depends on a definite series of "movements of attention," and a due repetition of the series. Thus in learning a poem by heart we carry on

attention from one word to another *in due order*, and by repeating this series of movements of attention again and again we are able on hearing the first words to recall, *i.e.*, represent, the succeeding words. As we all know, the effect of many repetitions is to make the process of reproduction semi-conscious and automatic. A child repeats a very familiar verse like a machine, *i.e.*, with but very little attention to the several steps of the process.

That the particular order of the movements of attention produces its effect on the retention is seen in the fact that in recalling any series, *e.g.*, a succession of events, or of words, our minds can move in the forward order much better than in the reverse order. Most children know the difficulty of saying the alphabet backwards.

It has been found by experiment that in recalling the members of such a verbal or other train suggestive force is exercised not only by the immediately preceding member of the series but in a less degree by remote members. Thus in saying, " One, two, three, four," the word " four " is suggested not only by " three," but in a less degree by " two," and in a still less degree by " one ". It follows that in repeating a verse from memory the first words of the second line are called up by *the whole group of words* of the first line. It is further ascertained that whenever such trains fall into a rhythmical form, as in the case of verses, tunes, and the like, we are greatly aided in recalling successive portions of the series by reproducing first of all the rhythmical form. This may be illustrated in recalling a long name, where we are apt to remember the number of syllables, the distribution of stress and the rise and fall of vocal pitch, before we distinctly recover the several articulate sounds themselves.

In many of the trains here referred to we have to do with complex members, and so with a more complicated process of Association. This can be best illustrated by the case of *verbal series.* A word is itself, apart from its meaning, a complex presentation. The first step in learning to speak is the linking on of a definite variety of articulatory movement to its appropriate auditory impression, the verbal sound. Later on, when the child learns to read, he combines with this associated couple the visual symbol, *viz.*, the printed word. Finally, in learning to write, new associations are built up between definite groups of finger, hand or arm movements and the corresponding visual symbols.

With this complexity of the word itself there goes the further complexity of the union of the word as a whole with its corresponding idea or meaning. Learning to speak, to read, and to write plainly includes this further connection between the word symbol and its meaning.

These complexes of ideas embodied in words are capable of becoming associated in definite series, and it is very largely by the aid of such series that our knowledge of things in their order of time and of place is retained. This applies even to what a child himself observes, for it is by describing in words what he has seen that he gives definite form and durability to his memory-series. And it applies still more evidently to all the knowledge which is gained by way of others' instruction. Here the facts are presented to the learner through the medium of language, which thus naturally comes to be taken up into the whole acquisition, and it is by this definite fixing of ideas in a verbal series that they are firmly held together, and can be readily recalled when they are needed.

(II.) The Mutual Suggestion of Similars. Memory-images are suggested not merely according to the law of Contiguous Association, that is, on the ground of the co-adjacency of the original presentations in time. A presentation will sometimes call up the image of a *like* presentation rather than of a previously associated one. Thus the face or the voice of a stranger may suggest by its "resemblance," as we say, another and familiar one; a word in a foreign language carries on the mind to a similar word in our own language, and so forth. This process of suggestion by similars is sometimes referred to as a "law of association"; but properly speaking there is no "association" in the case.[1] It is best described as *suggestion by similars*. Its law may be stated thus: *Presentations and experiences tend to call up images of previous presentations and experiences which resemble them in one or more respects, the suggestive force increasing with the closeness of the resemblance and the number of points of similarity.*

This process of reproduction is clearly related to the assimilation of presentations already considered (see above, p. 172). Each process involves the working of the assimilative function of intellect. At the same time there is a difference between the two. In recognising an object which we now see there is no distinct calling up of an image of the previous presentation. But when a line of poetry makes me think of another and similar line the image of this last is present along with the

[1] That is to say, not until the similar idea has been called up. When it is "revived" it may be said to become associated by the fact that it is now before the mind in juxtaposition with the presentation or idea which suggested it.

other and new presentation. In other words, suggestion by similars is a true process of image-revival.[1]

Association proper (Law of Contiguity) and Suggestion by Similars work in different directions. The former connects for our thought objects, events, words, and so forth which present themselves together in our experience. The suggestive force of similarity on the other hand brings together in consciousness the ideas of objects and events which may be widely remote in space and time. A face seen to-day in a London crowd may remind a traveller of another seen many years ago in the heart of the African desert.

This revival of similars, as a mode of assimilating the new to the old, frequently takes part in what is called Apperception. A child, almost as soon as he begins to use words, brings the new object which presents itself into a relation to what he knows already. That is to say, the new presentation recalls by suggestion of similars the familiar one. Thus one child on first seeing snow fall exclaimed, "Look at the white smuts". It is the same with the acquisition of new knowledge, by way of books and teachers. If everything we had to learn were absolutely new, presenting no points of kinship with what we already know, we should be unable to assimilate it in the sense of completely grasping and understanding it; for, as we shall see, to comprehend a thing is to classify it with other like things. A child "takes in," that is, makes his own, the new presentation or idea, say the form of the tiger in the cage, the picture of the Princes

[1] There is, of course, an intermediate case where a presentation, say the face of a stranger, reminds me vaguely of some familiar face, though no distinct representation of this last is recalled.

in the Tower, by recalling and applying ideas of familiar objects and experiences.

Again, without this support from the similarities of things the labour of committing to memory would be insupportable. When a boy or a girl comes to study a new language the similarities between its word-forms and those of the mother-tongue very greatly shorten the labour. Thus when the French *café* is seen as having a strong family likeness to *coffee*, or the German *Hund* to *hound*, its meaning is at once fixed, without the need of the repetitions required for contiguous association. The new acquisition is permanently retained by becoming attached by a bond of similarity to a pre-existing group of acquisitions.

It is to be noted, further, that every discovery in new presentations of a similarity to what is already familiar is accompanied by a feeling of pleasurable elation. To assimilate the new and strange to the old by some point or points of kinship is to rise above the unpleasant feeling of strangeness. Children show in their expression that the bringing of new objects and ideas into some relation of likeness to old ones gives an intense feeling of relief and satisfaction. And this feeling-accompaniment serves to give to the subsequent mental connection between the similar things much of its firmness.

(III.) Suggestion of Contrast. In addition to the suggestion of Similarity psychologists sometimes speak of Contrast as a distinct principle of suggestion. By this is meant that a presentation (or idea) tends to call up the image of its opposite or contrast. Thus it is said that black suggests white; poverty, wealth; a flat country, a mountainous, and so forth.

It is now generally held, however, that contrast is not a fundamental principle of suggestion, as is similarity. The mental connections built up between contrasting ideas may be explained as the result of other principles. (*a*) To begin with, we must remember that all knowledge commences, as we have seen, with a discrimination of presentations. At the first a child discriminates between impressions of the same kind which are *widely unlike*, that is to say, which form *a contrast*, as, for example, light and dark, sweet and sour, a big, grown-up person and a little child. This is illustrated in the fact that children when they begin to describe in words what they see are apt to use expressions of this kind, "This a clean plate, not a dirty plate," showing that at first they distinctly attend to contrasts.[1] This habit would in itself tend to build up in the child's mind a number of associations between contrasting things.

(*b*) The presentation of a relation of contrast between things is in itself impressive, and by attracting a child's attention leads to a lasting association of the ideas. If you want to fix an impression on a child's mind you cannot do better than put it in juxtaposition with a strongly contrasting impression. This is one of the most valuable principles in teaching. To bring out a striking contrast between two contiguous countries or between two consecutive reigns in English history is to do much to fix an association between the two in the learner's mind.

The unexpected and exceptional character of a presentation produces a closely analogous effect: we contrast an occurrence with the general rule, with our antecedent ideas of what is natural, appropriate and so forth. Sir J. G. Fitch gives a good example of this effect in

[1] See, for examples, my *Studies of Childhood*, pp. 175, 442.

imprinting a fact on the memory, *viz.*, the unexpectedness of the information that *Rule Britannia* was written by Thompson, the singer of quiet pastorals. I myself learnt that the college courts were called "quads" (quadrangles) at Oxford and not at Cambridge by noting the contradiction of the natural expectation that the mathematical University would have used the geometrical term. For other illustrations see M. Perez, *L'Enfant de trois à sept ans*, chap. i.

Simple and Complex Suggestion. So far it has been assumed that suggestion is simple, that the suggestive force of a given presentation acts in one single direction only, *viz.*, the revival of a particular memory-image. But this does not correspond with the facts. Suggestion is a highly complex process. One element of our knowledge may enter by associative attachment into a number of distinct combinations. Thus the image of the Coliseum at Rome is associated in my mind with those of events in my personal history, of pleasant days passed at Rome, and also with those of historical events, such as the gladiatorial combats of the Empire, its conquests and luxury. In addition to such divergent lines of associative reproduction, we have the effect of the suggestive tendencies of similarity and contrast. Thus the idea of the Coliseum tends to call up those of other similar buildings, *e.g.*, the amphitheatre at Verona, and (partly by contrast) those of adjacent modern buildings. The pathways of suggestive revival are not distinct and parallel, like the strings of a harp, but intersect one another, forming an intricate network.

Divergent Suggestion. Looked at from one point of view the fact of this complexity of connections between the parts of our knowledge is an obstruction to the revival of ideas. If the idea of the Coliseum tends to call up a diversity of images, then the mind in

setting out from this idea is liable to be borne along any one of a number of divergent paths. Accordingly it is less likely to strike upon any one particular suggestive path that is required at the moment. This may be called the effect of *Divergent Suggestion.* It is like being in a town and having to find one's way out by a particular road. The multiplicity of paths is here a hindrance. The errors of confusion into which children are apt to fall when, in repeating a poem, singing a tune from memory, and so forth, they go off on a wrong mental track, are due to the fact that certain members of the series they are recalling, *e.g.*, phrases of the poem or of the tune, enter into other combinations, and so lead their minds astray. A teacher sends me as an example the following. Two stanzas of Tennyson's poem *The Revenge* begin respectively with these lines :—

(1) "And the sun went down, and the stars came out," etc.
(2) "And the night went down, and the sun smiled out," etc.

The similarity here—which is of course (along with the contrast) a strikingly beautiful feature—led a child to confuse the stanzas by substituting for the correct line the similar one, and passing on to the context of this last. The effect of such divergent connections in leading the mind away from what is wanted has been marked off by Dr. Bain as *Obstructive Association,* but since the operation of similarity as well as of association proper is involved, it is best described as *Obstructive Suggestion.*

CONVERGENT SUGGESTION. Viewed in another way, this multiplicity of connections between one idea and other ideas is a great aid to the recovery of these.

Since a number of mental elements are each fitted to suggest one and the same image, it follows that when the former are present the probability of a revival is greatly strengthened by their co-operation. This may be called the effect of convergent suggestion. In this case we are in the advantageous position of a person *outside* a town, and able therefore to get to its centre by any one of a number of roads converging on the same point. Thus if I read a work on Roman history the image of the Coliseum may be called up by the co-operation of a number of suggesting ideas. The general effect of such co-operation may be stated in the form of the following principle : *the reproduction of a given memory-image is aided and made more certain, the more numerous its associative connections with the group of presentations and ideas now present in consciousness, and the more numerous its relations of similarity to these.*

This aid from convergent suggestion is seen in recalling those complex series already dealt with, and especially verbal series, together with the connected series of ideas. In repeating a poem, for example, a child is aided by the suggestive force of the words already uttered (both as sounds and as articulatory movements) and also by that of the ideas attached to these.

Another and somewhat different kind of example is recalling the date of an historical event. This, we will suppose, is associated in the child's mind with that of simultaneous events at home or abroad, as well as with those of preceding and succeeding events. Consequently, any one of these associated concomitants may help to recall it.

In this convergent and co-operative action of suggestion similarity often aids association. A person's name may be recalled not only by calling up his appearance, the tones of his voice, or other associated impression, but also by way of some other name which it resembles, in length, distribution of accent, and in the presence of certain common sounds, more particularly the initial one. The reproduction of the order of succession of our Saxon kings may be aided by the similarity of their names, just as the learning of the verses of a poem may be aided by the recurring similarities of metre and rhyme; though, as we have seen, this same force of similarity may easily become obstructive and confusing.

Most revivals of ideas involve a measure of co-operation. When, for example, after years of absence, I revisit a familiar place, the revival of some recollection is due to the suggestive force of a number of elements, such as this and that visible feature, the characteristic sounds, and, it may be, the characteristic odour of the spot.

One aspect of this co-operation is of great importance to the teacher. Our knowledge of any subject involves a whole group of ideas duly arranged and organised. Thus a child's knowledge of a lemon when made full and methodical includes not only representations of its several qualities, but those of the plant on which it grows, the countries in which it thrives, the way it is brought to this country, its uses, and so forth. That is to say, knowledge involves a kind of intellectual *system of parts*. In many cases, where some constituent idea of this system is to be called up, several other parts are first revived, and so act as suggestive forces. In a class of English history a child is specially ready to re-

call some historical fact asked for because the circumstances of the time, and the preceding talk about this and that historical personage and event, have served to agitate slightly a whole group of "psycho-physical dispositions" answering to his historical knowledge. The same thing is seen in the ease and rapidity with which we can talk a foreign language which we know when we are in the country where it is spoken, and so have the whole system of brain activities, together with the connected mental activities which constitute the lasting basis of our knowledge, specially played upon.[1]

SUMMARY OF LAWS OF SUGGESTION. We may now summarise the several conditions of suggestion under a number of special laws.

(1) First of all, in all cases, whether suggestion takes place by the aid of Contiguity or of Similarity, the revival is determined by the impressiveness or depth of the original presentation or series of presentations. It is only when the conditions which serve to develop a distinct memory-image have been realised that this image can be called up by the suggestive forces. In other words, suggestion always depends on the *tendency* or *disposition* of the image called up to reinstate itself (see above, p. 217).

(2) Secondly, in all cases alike the process of suggestion is furthered by the strength of the suggestive presentation or idea present at the moment. The more vivid, interesting and prolonged the presentation, the more likely is it to suggest an image related to it, whether by

[1] The advanced student may well read in this connection what Mr. G. F. Stout says about apperceptive systems (*Analytic Psychology*, ii., p. 124 ff.).

Contiguity or by Similarity. Hence presentations have in general much more suggestive force than ideas. We are far more likely to recall an event if we actually see the place where it occurred than if we merely imagine the place. The same applies to the revival of similars.

(3) The Law of Contiguity, already defined (p. 218).

(4) The Law of Similarity, already defined (p. 226).

(5) The Laws of Complex Suggestion. These are as follows: (*a*) If a perception or idea now present tends to call up more than one image, the particular line of suggestion followed out will depend, first of all, on the relative strength of the several "psycho-physical dispositions" underlying the revivals of the several competing images. A word with several meanings will most probably suggest that meaning which we have recently been thinking about. With this must be taken the relative closeness of the associative bonds, or, in the case of similars, the relative degree of similarity which obtains between the reviving presentation and the several ideas which may be revived. That meaning of an ambiguous word which has been most firmly fixed by usage and repetition will be the most readily recalled. (*b*) In the cases in which a number of suggestive forces cooperate, the tendency to bring up the image increases with the number of the suggestive agencies, and with the suggestive force of each. When we revisit the scene of some personal experience the recollection of this last is aided by the number of suggestive forces at work, such as the sight of this room, this garden, this person; and the more potent these reminders, the more fully and vividly is the memory of the experience recalled.

Active Reproduction: Recollection. The reproduction of impressions is very often, comparatively speaking, a passive or mechanical operation, in which there is no control of the successive stages by voluntary attention. In many of our idle moments, *e.g.*, when taking a walk in the country, the mind abandons itself, so to say, to the play of the forces of suggestion.

In contrast to this passive process of reproduction, there is an active process in which the will co-operates. Here, too, the order of the images which arise is ultimately determined by the forces of suggestion. We cannot by any effort secure the revival of an idea except through the medium of these suggestive agencies. A child, for example, cannot recall yesterday's lesson simply by trying to do so, supposing that the lesson has not previously been properly learnt and connected with other knowledge. But, assuming that these conditions are fulfilled, the child who has the requisite will-power can by an effort so guide and control the processes of his mind at the time as to aid in the reproduction of what he has learnt. This active side of reproduction is best marked off as Recollection.

The nature of the volitional process will have to be considered later on. Here it is enough to say that the effort spoken of consists in a specially strenuous act of concentration on what is before the mind, with a view to give it greater distinctness and greater persistence. Thus if a child is asked the date of a certain battle, he may by a special effort fix his attention on the image of the battle (or, as perhaps more frequently happens, on the image of the page in the history book), and thereby develop it into a steady and clear mental picture.

And by so doing he helps to bring out all the suggestive force of this idea. Not only so, the will accomplishes an important work in resisting divergent suggestions by turning the attention from all misleading reminders, and perseveringly following up the useful clues which present themselves.

It is to be noted that the revival of an impression, such as that of a name or of an event, is very often a gradual process. We may be dimly aware beforehand of the character of the idea we desire to call up clearly, and by a resolute effort we may keep "pegging away" until we reach and grasp it. Nay, as we all know, we may even try to recall apparently with no result, and only later, when the effort has ceased, find that our "pegging away" has somehow set going brain processes which, by stirring certain "psycho-physical tendencies," issue in the emergence in consciousness of the desired idea.

It is to be borne in mind that this steadying action of the will enters, in a less marked manner, into all our ordinary processes of reproduction. Even in repeating a well-learnt poem a child's will, by an effort so slight that he may be scarcely aware of it, guides the whole process, securing the due succession of the several members of the train, and the avoidance of misleading suggestions. And a complete relaxation of this attitude of attention at any moment would be fatal to the due carrying out of the operation.

This ability to control the reproductive processes reaches its highest development in a habit of going over the contents of memory, and following out, now one line of suggestion, now another, according to the purpose in

hand. It is this ability which is illustrated in the readiness of an intelligent child to answer the teacher's questions, to go back to the surroundings and attachments of a piece of knowledge, to find examples of a rule, analogies to a historical event, and so forth. This ready command of the mind's store of knowledge by the will presupposes that there has been an orderly arrangement of the materials, that new facts when learnt have been taken up as ideas into *systems of ideas*. It is only when there has been in the earlier or acquisitive stage of knowledge a close concentration of attention, and an orderly synthesis of materials into organic wholes, that there can be a ready command of the mind's materials in the later stage of reproduction.

CHAPTER X.

REPRODUCTIVE IMAGINATION (CONTINUED): MEMORY.

MEMORY AND MEMORIES. Memory is the function of Retention as manifested in the reproduction of images, when this has been developed into a complete faculty of recalling past experiences in their proper connections. Its laws have been considered in the foregoing chapter. We have now to examine the different varieties which it assumes and the manner of its development.

The degree of perfection with which we remember anything may be measured by two main tests: (1) the length of the time-interval which has elapsed between the original experience and the revival of the memory-image, and (2) the degree of completeness and distinctness of the images which are called up, as also the readiness with which they are reinstated. Thus a child may be said to remember well something he has seen or heard about in a lesson when he can recall the impression months afterwards, and can call up a full and distinct image of the matter, and without effort; whereas he remembers badly when he can only do so a day or two afterwards, or only very indistinctly, and with effort.

Although we commonly speak of memory as if it were a simple indivisible faculty, it would be more correct to say that it consists of a number of distinct aptitudes.

The ability to recall readily and distinctly one order of impressions, say colours and their arrangements, is different from the ability to recall another order, such as musical tones and their combinations. There are as many varieties of memory or "memories" as there are different classes of sensation. Within the limits of one and the same sense, too, there are distinct differences of memory. Thus the ability to recall colours distinctly is a different aptitude from that involved in a ready and clear reproduction of (visible) forms. Similarly the recalling of musical sounds rests on a different aptitude from that involved in the reproduction of articulate or verbal sounds. Modern scientific research shows that the memory for one order of impressions may be destroyed by brain-disease without the other memories being impaired; and this suggests that our several memories, like our several powers of perception (seeing, hearing, etc.), are connected with different parts of the brain.

Speaking generally, and disregarding for the present individual differences, we may say that the higher the sense in point of discriminative refinement and of knowledge-giving value, the better the corresponding memory. Of all orders of sense-presentations visual impressions or "sights" are in general recalled most perfectly. Our knowledge of things is largely made up of visual images or "mental pictures". Next to these come auditory (or aural) presentations. As pointed out above, words play an important auxiliary part in the memory of things. When we recall a series of events we commonly have an accompaniment of "internal speech," which consists partly of auditory and partly of motor images (those

corresponding to the movements of articulation). After auditory impressions there follow tactile ones, which in normal cases (though, as we have seen, their images are taken up into visual percepts) seem to be not easily reproducible as separate presentations.[1] Finally come the two lowest of the special senses, which, as might be expected, give rise in general only to very vague images. With respect to motor presentations, *viz.*, those supplied by movements of the limbs, articulatory organ, eyes, etc., the reproduction is fairly good. Here, too, it is to be noted that the process of reproduction is commonly complex, the motor elements being aided by others. Thus the child recalls the manual movements involved in writing or in playing the piano by the aid of *visual* images of his moving hands.

EARLY DEVELOPMENTS OF MEMORY.

EARLY GROWTH OF MEMORY. The beginnings of what we call a memory presuppose a certain development of sense-perception. The inability of the infant mind to keep up an image even for a very short interval after the occurrence of an impression is illustrated in the fact that after examining a biscuit tin and finding nothing in it an infant will directly afterwards put its hand in again, apparently losing all trace of its previous experience. On the other hand, children, even in this early period, clearly display the lower form of retentive power, *viz.*, that of recognising objects when they again present themselves after an interval. Thus a child less than three months old

[1] In the case of the blind, the constant reference to touch-experience leads to a much fuller revival of its presentations.

will remember the face of his nurse or father after a separation of some weeks. A certain development of this process of recognising objects is necessary before there occur images, in the complete sense of this term, that is, mental representations detached from present sense-impressions.

The first images to be recalled are such as are closely associated with, and so immediately called up by, the impressions of the moment. A child reveals the beginnings of a true reproductive imagination in the attitude of *expectation*, as when he shows that he understands the preparations going on for the meal, the bath, and the like. This has been said to manifest itself in the twenty-first week.[1] As the interest in things extends and the observing powers are strengthened by exercise, more complete and distinct mental pictures of objects are developed. A child of three months showed, according to Perez, the germ of reproductive imagination when, happening to see the cage without the bird he was accustomed to see and hear in it, he manifested all the signs of bitter disappointment.[2]

Effects of Repetition and of Novelty of Experience. As experiences repeat themselves, the mental images become more distinct, and are more firmly associated. The learning of the meaning of words, which may

[1] See *The Mental Development of a Child*, by K. C. Moore, p. 100 (Macmillan & Co.).

[2] See his volume *The First Three Years of Childhood*, p. 147. Mr. Darwin in some notes of one of his children records the first distinct appearance of ideas or images at five months. At this age the child, as soon as his hat and cloak had been put on, became very cross if not taken out at once.

begin early in the second half year, *i.e.*, several months before the actual employment of them, greatly enlarges the range of suggestion.[1] After the meaning of verbal signs begins to be understood the mother or the nurse may help to suggest the image of an absent object, such as "papa" or "bow-wow," by talking of it. The regular repetition of conjunctions of experience further brings about the formation of more complex groups and series of representations. Thus a child of eighteen months will mentally rehearse a whole series of experiences, *e.g.*, those of a walk: "Go tata, see gee-gee, bow-wow," etc.

It may be added that suggestion by contiguity appears distinctly to precede that by way of similarity. The latter grows out of the first "automatic" kind of recognition. In one instance it was first observed in the fortieth week.[2]

The child's experience is far from being a mere series of repetitions. The world is new, and full of wonder for the little observer, and his attention is ever being drawn hither and thither to some fresh marvel. Attention to the new is furthered not only by alterations of surroundings (some of which are caused by his own actions), and especially by the introduction of novel persons, scenes, and incidents, but also by an expansion of the child's interest in things. Thus the germ of an interest in self and its concerns leads the child to observe and to remember how a particular person behaves towards him: a nascent interest in "pussy" leads to the noting

[1] Mr. Darwin's boy at the age of seven months would turn and look at his nurse when her name was pronounced.

[2] K. C. Moore, *op. cit.*, p. 93.

and retaining of any new impression in relation to this favourite.

At first, events, even when noted, appear to leave but a temporary impression on the mind. Yet at an early age a child displays the germ of a more lasting retention. One child twelve months old is said to have recognised his nurse after six days' absence, though this, according to Preyer, is a rare occurrence. It is only later that experiences appear to become firmly woven into something like a memory-texture so that a child is able to recall an incident months afterwards, and with its proper concomitants. A child of two or two and a half sometimes displays a marvellous power of recalling little incidents long after they have happened. Towards the end of the third year this greater reach of retention becomes more frequent. At about the same age at which, as we shall see, a child comes to a clearer consciousness of self, he acquires the germ of what we call lasting recollections.

The growth of memory from about the sixth to the twelfth year appears to be very considerable. This is seen in the greater readiness or quickness with which new impressions are acquired. It has been found that the power of reproducing a string of numerals or of nonsense-syllables immediately after hearing the series is much greater in the case of a child of twelve or fourteen than in that of a younger child. The older child can reproduce a longer series, and requires fewer repetitions of the sounds in order to reproduce a given series with perfect correctness. And what applies to these temporary recollections applies also to the more permanent ones; it is easier for the former child than for the latter to learn poetry.

The earlier experience and knowledge tends to some extent to be dislodged by the later. A child at school has forgotten much of his baby experiences, his nursery rhymes and so forth. It is only so far as new impressions are connected (by way of similarity and contiguity) with older ones that these last tend to persist. That many at least of these earlier impressions are merely borne down by newer impressions is seen in the fact that towards old age, when the power of acquiring new impressions is impaired, the memories of early life often revive with considerable fulness and vividness.

Causes of Growth of Memory. This increase in memory power is due to some extent to developmental changes in the brain. All mental acquisition appears to involve the formation of new nervous connections. The readiness of the organ to undergo these changes, known as its "plastic" power, increases rapidly during the early years of life. This fact explains the precocity of memory. It is commonly said that the power of acquiring new impressions, as measured by the smallness of the effort of attention and of the number of repetitions required, reaches its maximum about the beginning of the period of youth (towards the age of twelve), and this suggests that later on the structure of the brain is more set and less capable of further modifications.

While, however, this increase in the plastic power of the brain is one great condition of memory-growth, it is not the only one. The power of acquiring and retaining knowledge is one which, like other powers, grows by exercise. More particularly the child's power of attention, which, as we have seen, is so important a factor in acquiring lasting impressions, is greatly improved by

methodical exercise. The precise effects of this exercise will be spoken of more fully presently.

VARIETIES OF MEMORY, GENERAL AND SPECIAL. There is probably no power which varies more among individuals than memory. The interval which separates a person of average memory from one of the historical examples, as Joseph Scaliger, Pascal, or Macaulay, seems scarcely measurable. Casaubon says of Scaliger: "He read nothing (and what did he not read?) which he did not forthwith remember". Pascal says he never forgot anything which he had read or thought. Persons of ordinary minds can only read such statements with dumb astonishment.

There are different ways in which one person's memory may differ from another's. In the first place, what we call a good faculty of memory presents different characteristics. For example, one boy may be *quick in acquiring* impressions, but not correspondingly *tenacious*, illustrating the saying, "easy come, easy go". Another boy may retain firmly what he has once thoroughly learnt, but be wanting in *readiness* in bringing out and using what he knows. Or again, a boy may show himself a ready learner and prompt in recalling, and yet, like many a fluent talker, be wanting in *fulness* and *exactness* of knowledge. These differences give well-marked peculiarities of character to the memories of different individuals.

In the second place, there are very distinct differences among children and adults alike with respect to the *range* of memory, or the amount and variety of material which can be retained. A comparatively few persons of exceptional endowment have a good *average power* of

retaining impressions of all kinds, whereas there are others who have a low average capacity. This is called a difference in *General Memory*.[1]

From these differences in the average power of retentiveness we may distinguish differences in the special directions in which the retentive power is strong. These are marked off as differences of *Special Memory*. For example, one child will be found to have a good retentive power for the impressions of a particular sense, say, sight or hearing, as a whole, whereas another will show a comparative weakness in respect of this class of impressions. Recent investigations have tended to prove that most, if not all, children have a favourite memory-medium. Thus in recalling words some prefer to represent the sounds, others the articulatory movements, others again the visual symbols. They have been distinguished as "audiles," "motors," and "visuals". Again, a child may display special aptitude in retaining some particular variety of the impressions of one sense, *e.g.*, those of colour or of form. Further, a special aptitude of memory frequently shows itself in relation to a particular class of object-presentations, such as voices or faces. In this way arise what are known as the musical memory, the pictorial memory, the memory for faces, for locality, and the like. Illustrations of such exceptional retentive power in definite directions are found in Horace Vernet and Gustave Doré, each of whom could paint a portrait from memory, and Mozart, who wrote down the *Miserere* of the Sistine Chapel after hearing it only twice.

Memories differ with respect not only to the kind of

[1] The student must, however, not suppose that the use of the word "general" here implies a single faculty of memory.

impression specially favoured but to the particular mode of grouping selected. Some minds connect visible objects in their local relations better than others; whereas these last may have a better power of linking together successive pictures answering to events. The former would have a better local, pictorial or geographical memory, the latter a better historical or possibly a better scientific memory. In some memories revival by similarity is less frequent than in others.

CAUSES OF DIFFERENCE. All differences in the general power and the special forms of memory would seem to be due either to differences in the organic basis or to those in the kind and amount of exercise previously undergone. A child's general superiority probably depends on a particularly fine development of the brain as a whole. As Locke observes: "An impression made on Bees-wax or Lead will not last so long as on Brass or Steel".[1] Similarly the narrower differences referred to point to original differences of *special* organs. The child that remembers colours well is the child that has the organs of colour perception, both peripheral and central, well developed.

At the same time it is clear that the differences observable in the degree of perfection of people's memories are due in part to differences of circumstances and of education. While in the case of every individual the amount of "natural retentiveness" or of "brain plasticity" sets limits to the growth of memory, much may be done by suitable exercise to improve the faculty within these limits. The discipline of the school, if judicious, tends very materially to strengthen a child's

[1] *Concerning Education*, sec. 176.

memory by developing to the full the capacities of his brain. Here the effects of concentration of mind in improving retention are specially noticeable.

In the improvement of memory in special directions the effects of exercise are still more clearly recognisable. If we suppose, as is sometimes done, that the retentive power of an individual's brain as a whole is a limited quantity, it is evident that special circumstances and education will determine the particular lines of development of this brain-energy. Common observation tells us that the habitual direction of the attention to any class of impressions very materially raises the retentive power in respect of these. The blind not only have better perceptions of touch than those who see, but they recall and imagine touches in a way that we perhaps can hardly understand. Owing to this effect of a habit of concentration *each mind becomes specially retentive in the directions in which its ruling interests lie.* Every special employment, such as that of engineer, linguist, or musician, tends to produce a corresponding speciality of memory.

Great speciality of memory commonly means one-sidedness, and relative inaptitude for other retentions. This is the drawback. Undue preponderance of natural power and of interest and concentration in some one direction lead, if not checked, to narrowness in the field of ideas.

MEASUREMENT OF MEMORY. As already pointed out, the new experimental psychology has endeavoured to measure the phenomena of memory. One class of these investigations test what has been called primary or temporary memory. Thus the inquiry has been carried out by A. Binet how far children are able to keep in their minds for four or five seconds the image of a vertical line, so as to say what line,

among a number of lines shown after this interval, appears equal to the first. Ebbinghaus and others have investigated the number of repetitions (*i.e.*, repeated presentations) of a series of nonsense-syllables, numerals arbitrarily arranged, and so forth, which is necessary to enable the subject to reproduce them fully and correctly immediately afterwards. In order to make these experiments a means of testing memory in its fuller sense, a considerable interval, say a day, should elapse between the process of acquisition and that of reproduction.

In addition to these experiments, others of a simple kind have been devised for testing the special directions and the rapidity of associative reproduction. A word is given, such as "cottage," and the subject asked to say at once what other idea (beside that of the word itself) is first called up. Some will say "garden," others "chimney," others "house," others perhaps "mansion" or "palace". In this way, it is evident, we are able to know something about the contents of children's minds and the special lines of suggestion which their reproductions follow.[1]

EDUCATIONAL CONTROL OF THE MEMORY.

TRAINING OF THE MEMORY. To exercise and improve the memory is allowed by all to be a part of the business of the educator, and more especially of the school teacher. Hence it is a matter of importance to understand what is involved in the training of the faculty, and by what methods it may be best effected.

Such training aims primarily at exercising the child in acquiring and reproducing intellectual material. This material is obtained either directly by the observation of things, as in the object-lesson, or indirectly by way of verbal instruction.[2] The more complete and distinct the resulting ideas and the more methodically and firmly

[1] For a fuller account of these experiments, see O. Külpe's *Outlines of Psychology*, translated by E. B. Titchener, § 27A, p. 177 ff.

[2] In this latter case the ideas acquired have to be developed by a special imaginative process, to be dealt with presently.

they are connected with other ideas, the better will be the training.

Along with this result, *viz.*, the accumulation and mastery of so much knowledge, the educator aims by means of such processes of acquisition at *improving the child's power of acquiring and retaining further knowledge later on.* In other words, he seeks to develop a good type of the learning faculty in general. As Locke puts it: "The business of education is not, as I think, to make them (the young) perfect in any one of the Sciences, but so to open and dispose their minds as may best make them capable of any, when they shall apply themselves to it".[1] So far as the teacher makes this wider result his object, he will be guided in his choice of materials as well as of methods by their fitness to contribute most effectually to the improvement of the learning faculty.

The culture of a child's memory claims the educator's attention from the first. As a precocious power it calls for no inconsiderable amount of exercise from the parent before the period of school life begins. The mother of a child of three or four often has quite enough to do to satisfy the cravings of the little one's "acquisitive faculty". The fact that impressions firmly fixed in the first years are the most lasting makes it specially important that a right kind of training should be supplied during the early development of the faculty. As Quintilian has it: "We are by nature most retentive of those things which we learned in the early years" ("Natura tenacissimi sumus eorum, quæ rudibus annis percepimus").

[1] *Of the Conduct of the Understanding*, ed. by Prof. Fowler, p. 44.

This regulation of the learning process may be said to begin with the use of language by the nurse and others in naming to the child the various objects of sight. The systematic training of the memory should, it is evident, be first carried out in close connection with observation. The meaning of words should be taught by connecting them with the real objects, that is to say, by simultaneously naming and pointing out an object. The naming of the several properties and uses of things is an important completion of the object-lesson (see above, p. 202 f.). As supplementary to this, the child should be exercised in recalling by means of words the impressions directly received by way of observation. The parent can do much to develop the memory of the child by encouraging him to describe what he sees, to narrate some new experience, and so forth.

After a sufficient store of first-hand knowledge has thus been accumulated, the memory should be trained in the acquisition of knowledge about things at second hand, that is to say, through the medium of verbal instruction. The early period of school life is the one most favourable for the building up of verbal acquisitions. It costs less effort in this early stage of development to learn the concrete facts of history, geography, language and the like than it would cost at a later date. Hence it has been called the "plastic period".[1]

In training the memory the different characteristics of a good memory should be kept in view. These, as already implied, are: (1) aptitude in applying the mind

[1] Professor Bain regards the years from six to ten as probably "the age of the maximum of pure memory, as typified by Language acquisitions" (*Education as a Science*, p. 186).

to a subject so as to acquire knowledge of it; (2) a firm mental hold on what is thus learnt, or tenacity of memory; and (3) readiness in recalling and making use of what has been stored up in the mind. To this some would add a fourth excellence, *viz.*, fidelity or accuracy in reproduction. As Quintilian says: "There is a double excellence of memory, to learn easily and to retain faithfully" ("facile percipere *et fideliter* continere").

A glance at these requisites suggests that memory-training falls into two main divisions: (*a*) exercising the pupil in a careful and methodical process of acquisition; (*b*) practising him in recalling what he has learnt. Although in practice these two branches of training run on together, we may, to a certain extent, treat them as separate processes.

(*a*) EXERCISE IN ACQUISITION. In this stage the first rule to be attended to is *to take the child at his best.* Committing anything to memory makes a severe demand on the brain energies, and should so far as possible be relegated to the hours of greatest vigour and freshness. The morning is now known to be the best time for learning. Heavy preparation work in the evening, especially in the case of young children, is distinctly injurious. At the same time the practice of refreshing the impressions of the day by going over notes of lessons has undoubted advantages; and many a learner has testified to the fact that rehearsing a lesson before falling asleep is an aid to the lively reproduction of it on the morrow.

The next rule is that every resource should be used for making the subjects to be learnt *as interesting as possible.* The complaints of many distinguished men about the

drudgery of school learning may remind us how easy it is to overlook this condition. A large number of boys have, like the old writer Schuppius, taken heart by committing things to memory "in spem futuræ oblivionis" ("in the hope of afterwards forgetting them"). It has been observed by an eminent teacher that "the memory of the young is very good if they care for what they are about". In order to secure this condition we must consult the learner's natural tastes to some extent, and keep in view what Locke calls "the seasons of aptitude and inclination". And we must further seek to develop a special interest in the subject studied. The awakening of interest, especially in the early years of the school when the love of knowledge for its own sake is limited, may proceed in part by helping the child to realise the uses of knowledge, and the power it brings to its possessor. Perhaps one of the chief drawbacks to the teaching of the school as compared with that of the home is that it tends to put the day's lessons so completely outside the circle of home-interests, which are after all the child's real life.

It is hardly needful to emphasise the point that in training the memory a judicious use should be made of *the principle of repetition*. Such repetition enters into the very process of giving instruction. Thus when a teacher after each step in an oral lesson writes down the points reached on the blackboard, he introduces a new sense-vehicle, the eye, and so tends to fix the subject by a form of repetition which avoids monotony, and introduces a new link of association. Repetition may also be secured by the evening work, writing out notes, and what should go with this, a talk about the lesson with

an intelligent parent. In all these ways the value of repetition is realised without its monotony.[1]

Lastly, the educator should make ample use of the great principle of *connecting ideas* on which all revival of impressions depends. In its bearing on instruction this principle includes two things : (1) the connecting one with another of the several parts of the new matter presented in the clearest way possible ; and (2) the bringing of the new acquisition into its right relations to the old ones. Thus, in teaching a geographical fact, say, the situation of Liverpool, its relation to commerce, and to other places, as America and Manchester—which not only form necessary parts of the whole geographical fact dealt with, but serve as associative bonds by help of which the knowledge of the particular fact of the locality may afterwards be revived—should be made clear. Similarly, in relating an historical event, the due setting forth of the several actions and incidents in their proper order of time, and the pointing out of the causes of what took place, supply connections of ideas of the greatest value for the memory. Clear retention of what is heard is further aided by a certain orderliness of procedure in which the more important events are used as a thread to which the subordinate events are, so to speak, strung on. In this case the several materials, being better arranged, are afterwards much more readily reproduced.

[1] On the importance of taking time to learn, Seneca observes : "The mind retains late what it has spent a long time in learning" ("Dediscit animus sero quod didicit diu"). As to the value of introducing variety and freshness into the repetition, it has been remarked that the very things best remembered by children, *viz.*, the words of their mother-tongue, are being ever repeated, but in ever fresh surroundings.

In building up these connections special pains should be taken to select *interesting* associations. Children are as a rule greatly interested in the making, and generally in the mode of production, of things; hence it is well to give prominence to their origin and their *causes.* For example, in teaching the geography of countries it is well to call attention to those in which rice, tea, the orange, or other natural produce is cultivated, as also to explain the mode of conveying it to this country.

In connecting the new with the old, again, there is ample room for the binding force of interesting associations. What is spoken of in educational works as "assimilating knowledge" includes this process. Thus in a geographical lesson a new foreign country, say India, becomes interesting when it is represented as the home and the source of cotton, of rice, or other familiar commodity. Similarly historical facts become interesting, and are likely to be remembered, when they are presented as stages in the making of what are familiar institutions of to-day.

What is specially known as "assimilating" knowledge implies the noting of the *similarities in the new facts and ideas to what is already known.* The bringing out of these relations of similarity forms an important factor in the training of the memory. When, for example, the new word has had its resemblance to a familiar word made clear, or the new historical fact has been compared with another similar one (say the Norman with previous invasions), not only does the new material have an interesting light thrown on it, but it is taken up into a connection of ideas which will serve to fix it in a permanent system of knowledge.

As supplementary to this exhibition of the similarity, and this rudimentary classification, of new facts, the teacher should bring out *the points of contrast* between the new and old facts. For instance, in teaching early English history we should do well to dwell on the striking dissimilarities between the Saxon and the Norman invaders, and between the effects of their invasions. In teaching geography, again, we may obtain the useful aid of a certain pleasurable excitement if we set forth wide and surprising deviations in habits of life from those of our own people, as when we point out that the Japanese eat with chop-sticks, and not with knives and forks.

We thus see that in order to retain his ideas a pupil has to *think out* the connections and relations of the facts. One may say, indeed, that the most effectual way of arranging the materials of knowledge for purposes of retention is precisely that which best subserves the understanding of the whole.

Learning by Heart. The most constant of the bonds of connection between ideas which are made use of by the teacher is Verbal Association. Teaching —even what is called object-teaching—necessarily makes use of the medium of language. In all cases the pupil is greatly aided by words in remembering what he learns. A special use of these verbal associations is illustrated in what is known as learning by heart. This implies that the learner firmly retains a piece of knowledge in a definite verbal form, which form becomes a support of the series of ideas acquired, as well as a medium for reproducing these. The learning of the multiplication table, of grammatical rules, of the "chief towns," of historical dates, and of poetry illustrates the process.

There is an obvious danger in this mode of learning: it tends to a mechanical habit of memorising the words merely, without a concurrent acquisition of the ideas. This parrot-like mode of learning is particularly insidious, and this for a double reason. The verbal memory being in general quick and tenacious in children, they are prone to lean on it to excess; and it is plainly a much simpler problem for the teacher to test whether a child has retained the verbal form than whether he has grasped the relation of ideas expressed by this form. It is now seen, not only that such verbal memorising is taking the husk for the nutritious grain of knowledge, but that it is, in spite of its mechanical facility, tiresome to children. "Learning by heart (says Locke) . . . I know not what it serves for but to misspend their time and pains, and give them a disgust and aversion to their books." George Sand tells us that when a child she was so tired of having to repeat La Fontaine's fables that she set herself *not* to learn them.

It is probable that the modern revolt from the tyranny of words has led us to undervalue the legitimate service of language in learning. In many cases, the embodiment of knowledge in a precise verbal form is clearly of the highest consequence. This applies to such things as to definitions and rules where the words are carefully selected for a special purpose and cannot be altered, and also to poetry and passages of prose where the literary form is an element of value.[1] Even in learning such a subject as history the verbal memory has its rightful part. What the teacher has to take care of is that he uses a

[1] This has been well illustrated by Sir J. G. Fitch, *Lectures on Teaching*, p. 131 and following.

child's verbal memory only as an auxiliary to the retention of ideas *after these have been made clear and duly connected one with another*, and never as a substitute for this, and that his pupil is not slavishly dependent on the particular words of the lesson or the text-book, but is able to put his knowledge into other forms when required to do so. That is to say, *learning by heart* is permissible if it does not degenerate into an unintelligent *learning by rote*.[1]

ART OF MNEMONICS. In ancient times great importance was attached to certain devices for aiding memory and shortening its work, which devices have been known as Artificial Memory, *Memoria Technica*, and the Art of Mnemonics. Thus among the Greek and Roman teachers of oratory, emphasis was laid on a *topical* memory, *i.e.*, the connecting of the several heads of a discourse with different divisions of a house or other building, so as to recover them by the aid of visual pictures of these places. In modern times, too, attempts have from time to time been made to shorten the more mechanical part of the process of acquisition, as in learning dates by Mnemonic word-forms and lines. This idea of relieving memory owed much of its apparent importance to the older theory that the main business of learning is to commit words to memory. Now that this theory is discarded, less importance is attached to a mnemonic art. When things are to be taught so as to

[1] Strictly speaking, even what is called learning by rote derives some assistance from the associations of the ideas. As Jean Paul Richter drily observes, memory of words as distinct from memory of things would be best tested by committing to memory a sheet of Hottentot names.

be understood, it is rightly held that their relations of place, time and cause and effect, as well as of similarity, should form the main basis of acquisition. In other words, the more things are connected in their *natural relations*, the less need there will be for the invention of artificial connections.[1]

Although there are no definite rules for aiding the memory which are valid in all cases, there is such a thing as a skilful management of the memory. This will include the formation of certain intellectual habits, namely, concentration and judicious repetition, as also the methodical selection and arrangement of knowledge-material. Memory-labour is greatly economised by detecting what is important, and overlooking what is unimportant. When Simonides offered to teach Themistocles the art of memory, the latter answered: "Rather teach me the art of forgetting". Children should from the first be exercised in selection. The labour of memory is lightened, too, by finding appropriate "pegs" on which to hang new acquisitions, such as the name of the book and the number of the page in which a particular piece of information can be found.

Learners will, half involuntarily, further the work of learning by all manner of devices that cannot readily be reduced to a definite formula. Thus one child in learning that the Tudors are followed by the Stuarts will notice the odd fact that the S's here *follow* the T's. One boy I have heard of learned to distinguish the situations of the rivers Rhine and Rhone as north and south by

[1] For an account of the different systems of Mnemonics, see article "Mnemonics," *Encyclopædia Britannica*, and article "Memory" in *Chambers' Encyclopædia*.

noting the similarity of the vowel sounds to those of the words *high* and *low*. In studying a foreign language a learner will often shorten the labour by discovering slight and fanciful resemblances between the new vocables and familiar words in his mother-tongue. These devices are perfectly allowable so long as the parts of the subject-matter to be learnt are connected in an arbitrary way only, and do not supply "natural relations"; such are lists of words of all kinds and numbers. For example, the height of Snowdon, 3571 feet, may be remembered as the first four of the series of odd digits, with the first transposed to the end. Where the matter committed to memory is such as requires to be learnt in a definite verbal form, the use of verse, with its similarities of rhythm and rhyme, as illustrated in the well-known mnemonic lines in grammar, logic, etc., is a valuable aid to the memory.

The aids thus resorted to will differ in the case of different children. Some appear to remember ideas better by the aid of visual pictures, others better by help of a series of sound-representations. According to researches made by Mr. F. Galton, it would appear that many persons in early life are wont to help themselves to retain what is difficult, *e.g.*, series of letters, numbers, dates, by picturing a visual scheme, as when the first twelve numerals are represented on a kind of clock face. Teachers would do well to find out these spontaneous tendencies of children's minds, and to adapt their modes of teaching as far as possible to these.[1]

[1] I assume here that these early number-schemes persist because of their utility in aiding the memory of the numerals. The student should consult F. Galton's work, *Inquiries into Human Faculty*, p. 114 ff. ("Number-Forms").

(*b*) Exercise in Recalling. The teacher has to exercise a child's mind in ready reproduction for a variety of reasons. First of all, he requires to ascertain whether knowledge is duly retained. Again, in the newer and better kind of teaching he needs to recall old knowledge in order to make sure of taking the pupil on to an intelligent grasp of new ideas. Lastly, a systematic teacher will have again and again to examine the contents of children's minds in a wider and more searching way, with a view to make them ready in looking up facts when they are wanted, as in discovering the cause of a thing, in finding analogies and contrasts to some new fact, in supplying examples of a principle to supplement those given by himself, and so forth. The art of questioning, which rightly holds so high a place in modern teaching, is the great means of training children in such methodical recollection.

Subjects which Exercise the Memory. All learning as such makes a certain demand on the memory. The student of the higher mathematics has to remember the principles and the demonstrations of his science, just as a student of history has to remember its particular facts. At the same time, certain subjects which have to do mainly with the concrete, and which appeal but little to the understanding, may be said to be in a special sense memory-subjects. Of such a kind are Natural Science, in its simpler or descriptive phase, Geography, History, Languages, and the lighter departments of Literature.

A complete exercise of the memory on its different sides involves the taking up of a number of different subjects, such as literature and the various branches of elementary science. A certain range and variety of

subject is thus good for the memory of the learner. At the same time, it is only too easy to set too many disconnected subjects so as to prevent that concentration and that systematic arrangement of parts in wholes on which clear and lasting knowledge depends. The ancients had a pedagogical maxim, "multum, non multa". Locke held that the true secret of learning is to attack one thing at a time; and so admirable a scholar as Lessing tells us that he followed this rule in his self-education. It is probable that in these days of many subjects, in spite of what Herbart and others have written on the importance of "concentration," a child's memory is often a confusion of unconnected fragments of knowledge rather than a clearly-arranged system of parts.

THE PLACE OF MEMORY IN INTELLECTUAL TRAINING. The value set on the training of the memory at different times and by different writers has varied greatly. The old idea was to identify memory and knowledge: "Tantum scimus quantum memoria tenemus".[1] No doubt, as we have seen, all instruction involves the activity of memory. Yet it is a long way from this to saying that the chief aim of teaching is to cultivate the memory. Intellectual education aims, according to the best theories, at a cultivation of intelligence as a whole, and at its best, and so at the development of the higher powers of "understanding" and thought.

Now a certain development of the memory is necessary to the due carrying out of these higher intellectual

[1] Miss Edgeworth gives an interesting account of the reasons why so much importance was attached to memory up to recent times (*Practical Education*, vol. iii., p. 57, etc.)

activities themselves. Unless the mind has acquired a good stock of clear concrete ideas about things, there will be no materials for the imagination to combine, or for the understanding to reduce to general concepts. As Kant observes: "The understanding has as its chief auxiliary the faculty of reproduction". Dugald Stewart tells us that he can scarcely recollect one man of genius who had not "more than an ordinary share" of retentive power.

On the other hand, it is a matter of common testimony that when the whole stress of education is laid on exercising the memory the effect is apt to be hurtful to these higher powers of thought; "beaucoup de memoire, peu de jugement," says a French proverb. Similarly, Pope observes:—

> "Thus in the soul while memory prevails,
> The solid power of understanding fails".

A right appreciation of values will lead the teacher when training the memory to exercise the child's intelligence as a whole, and in particular to train him in so arranging his memory-material as to give the chief and central place to the essential and important ideas. Such arrangement is already a step in classification, that is, in methodical thinking. It is the distinguishing mark of what Dugald Stewart called a "philosophical memory," that is, of the orderly memory at its best.

REFERENCES FOR READING.

For a fuller account of the processes of Memory the student may consult the following: Sully, *The Human Mind*, chap. ix.; W. James, *Psychology*, chaps. xvi. and xviii.; J. Ward, article "Psychology" in the *Encyclopædia Britannica* ("Mental Association and the Memory-Continuum"). The experimental investigation of the processes of

Association is described by O. Külpe, *Outlines of Psychology*, § 27*a* (p. 177 ff.), and E. B. Titchener, *Outline of Psychology*, chaps. viii. and xi. Individual differences of Memory-power are illustrated by Carpenter, *Mental Physiology*, bk. ii., chap. x. The reader of German may further consult: J. Huber, *Ueber das Gedächtniss*, and Franz Fauth, *Das Gedächtniss.*

The early development of Memory in Children is dealt with by B. Perez, *The First Three Years of Childhood*, chaps. viii. and ix., also *L'Enfant de trois à sept ans*, chaps. i. and ii.; and by G. Compayré, *The Intellectual and Moral Development of the Child*, chap. vi.

On the Educational Management of the Memory, the following will be found useful: J. Locke, *Some Thoughts on Education*, especially sect. 176; Miss Edgeworth, *Essays on Practical Education*, vol. ii., chap. xxi.; E. Thring, *Theory and Practice of Teaching*, part ii., chap. vii.; Lloyd Morgan, *Psychology for Teachers*, chap. ii. ("Association"); and G. Compayré, *Psychology applied to Education*, chap. v. (Isbister). In connection with this subject the student may with advantage read the account of the proper mode of connecting the parts of knowledge given by K. Lange, *Apperception*, part ii., sects. i. and ii.; also consult *Connection between Thought and Memory*, by Dörpfeld, translated by H. T. Lukens (Heath & Co., Boston, U.S.A.). The reader of French and German will also find the following useful: Madame Necker, *L'Education Progressive*, livre vi., chap. vii.; G. Compayré, *Cours de Pédagogie*, leçon vi.; Henri Marion, *Leçons de Psychologie*, 32ème et 33ème leçons; B. Perez, *L'Education intellectuelle*, chap. ii.; Beneke, *Erziehungs und Unterrichtslehre*, §§ 20-22; Waitz, *Allgemeine Pädagogik*, § 24; T. Ziller, *Allgemeine Pädagogik*, § 24; and J. Hoppe, *Das Auswendiglernen und Auswendighersagen.*

CHAPTER XI.

PRODUCTIVE IMAGINATION.

Reproductive and Productive Imagination. The process of reproduction involves, as we have seen, the picturing of objects and of their changes in what are called representative images, and is thus a form of imagination. But what is popularly known as imagination implies more than this. When, for example, we imagine a new experience in the future, say a tour abroad, or an unknown place which is described to us, the images called up are no longer in their form and mode of arrangement a reproduction of past experiences. The results of experience, the series of memory-images, are in this case undergoing a change: they are being modified and rearranged. Hence this form of imagination has been marked off as Productive Imagination.

It is important to add that while the reproductive processes thus underlie and sustain production, there is a reciprocal effect. As we shall see presently, productive imagination by contributing new images and combinations of these supplies further materials to the memory. A child is rightly said to "learn," that is, retain, the facts of history and so forth which it apprehends by way of imagination.

This production of new images and groups of images out of old materials appears in different forms. In its earlier phases it is comparatively passive and unconscious, the memory-elements *rearranging themselves*,

so to speak, under the sway of some feeling, such as the love of the marvellous. The groups of images which arise in consciousness during sleep and form our dreams, and much of the wilder kind of "childish fancy," illustrate this more automatic form of production. From this lower form we must distinguish imagination in its higher sense, in which the whole mind is active, and in which there is a controlling and directive action of the will. This may be illustrated by the methodical process which is carried out by a student in realising a historical narrative. This more active and methodical form of imaginative activity is known as Constructive Imagination.

THE CONSTRUCTIVE PROCESS. (*a*) The process of constructing new images, like all intellectual elaboration, requires first of all certain *materials.* These are memory-images revived by the processes of suggestion. Thus a child in trying to form an idea of an African desert or of the Spanish Armada necessarily sets out with certain facts of his own experience recalled by memory, such as the familiar stretch of sand on the seashore, or a fleet once seen at Portsmouth or elsewhere.

It follows that the excellence of the constructive process is, in every case, limited by the fulness and the clearness of the memory-images. Unless a child has seen objects resembling those now heard of, and can call up clear images of them, the whole process of construction is arrested. The child that can most clearly recall the appearance, the glare and heat of the sand on a summer day will, other things being equal, most readily form an idea of the desert.

(*b*) The images of memory thus recalled at once undergo modification. They tend to form *a new organic whole.*

This formation is aided in all cases—in that of the child picturing the desert, as well as in that of the poet creating a scene in Hades—by the automatic rearrangement spoken of above. This supplies what may be called the first *draft-image.* It is the rough outline which has to be carefully filled in or developed afterwards. It is this detailed development of the draft-image which illustrates the orderly process of construction. The mind here goes in search of material, and carefully compares and selects what is fitting, what helps to make the image more complete and more " real ".

This part of the process illustrates the action of an enlightened will. When an artist elaborates a new idea, say, for a picture, his selection of this and that feature is a process of volition, a *choice* of what is recognised as good for his purpose, what will combine harmoniously and pleasingly with the other elements selected. This choice is clearly guided by a sense of what is fitting, that is to say, by a *discriminative judgment.* The finer this judgment the better the result. The great poet is one who not only has a great wealth of imagery, but a fine sense of æsthetic fitness and harmony.

The process will assume a slightly different form according to the special aim which controls it. In artistic construction, as we have just seen, it is a sense of beauty, of harmony, which determines the rejection of this imaginative element, the selection of that. On the other hand, a child when imagining a desert, a glacier, or other strange object is guided by a sense of consistency and of truth. He wants to understand, and he tries so to combine his material as to produce an *intelligible whole.*

I have illustrated the process of constructive elaboration in two dissimilar lines of activity, the understanding of a description of an unknown object, and artistic invention. Although both of these processes are intellectual construction, *i.e.*, elaboration of materials gained by way of sense-perception into new imaginative forms, that of artistic production is of a much higher kind. It involves origination, *creation*, as distinguished from a mere imaginative assimilation of another's ideas, which, though a process of activity, is a simpler process, and by contrast may be called *reception*. The poet's work in picturing a new scene, and combining a series of such scenes into a work of art, is a highly complex process, and presupposes a rare variety of intellect. There is many a child who can follow a geographical description, and appreciate a fairly simple poem, but who would be quite incapable of creating new ideas for himself. It is the same with scientific knowledge. It is one thing to assimilate a fact discovered by another and well described; quite another thing to discover a fact for oneself by a process of constructive invention.

Various Directions of Constructive Activity. The process of imaginative construction just described follows different directions, which differ by reason partly of the nature of the material used, partly of the special aim controlling the process. These may be conveniently classed under the following heads: (A) Intellectual Imagination, or that process of construction which subserves knowledge. This again may be subdivided into the following: (1) Imagination, as aiding in the knowledge of sensible objects, their qualities and their relations.

This is what is commonly thought of as imagination in connection with intellectual instruction. It may be marked off as *the Imaginative Apprehension of the External World.* (2) Closely related to this is the process of imaginative construction as employed about facts of inner experience, thoughts, feelings and desires, whether those of ourselves, in certain supposable circumstances, of other persons, or of the lower animals so far as they are known to share in our experiences. This may be called *the Imaginative Apprehension of the Inner World.* This direction of imaginative activity, while furthering knowledge, stands, as we shall see, in close relation to Sympathy and to the whole process of Moral development. (3) A third variety has to do with the construction of ideas of new actions, ranging from simple movements such as are required to produce a new effect, say, a verbal sound or a written word, up to complex actions, such as are involved in learning to play a new musical instrument, or in fitting together material things, so as to obtain a new mechanical device. This variety is characterised in part by the presence and prominence of motor ideas (ideas of our own movements) together with their external results. As such, although it is intellectual in the sense that it furthers our knowledge how to do things and to produce new external results, it is essentially *practical*, and forms an important constituent in the development of our active powers. Moreover, when it involves the invention of new aims as well as of the agencies or means which lead to the realisation of these, it becomes an important constituent in the whole process of volitional and moral development. This may be appropriately called *Practical Construction*.

This will be dealt with again in treating of the development of voluntary action.

(B) From these forms of imaginative activity, each of which subserves knowledge of some kind, we must mark off that form which is controlled by feeling, and which subserves emotional gratification. This is illustrated in the "play" of imagination in day-dreaming, where the whole process is sustained and directed by the pleasurable feeling which accompanies it. Such mental picturing of things is not resorted to because it helps us to *know* the real world—it may take us far away from reality into the region of the impossible; we indulge in it solely because of the gratification it yields us. Since the highest form of this feeling-controlled imagination appears in connection with the appreciation and enjoyment of beauty in nature and art it may conveniently be marked off as *Æsthetic Imagination.*

(A) (1) IMAGINATIVE APPREHENSION OF THE EXTERNAL WORLD. A moment's thought will show us that every extension of our knowledge beyond the bounds of personal observation involves some amount of imaginative activity. This is seen alike in the *acquisition* of new knowledge from others respecting things, and in the independent *discovery* of new facts of the outer world by anticipation or imaginative prevision. The first is the lower or receptive form of intellectual imagination, the second the higher and more originative.

(*a*) IMAGINATION AND THE ACQUISITION OF KNOWLEDGE. The process of recalling, selecting and regrouping the deposits of past experience is illustrated in every case of acquiring knowledge from others through the medium of language. What is ordinarily called "learn-

ing," whether by oral communication or by books, is by no means simply an exercise of memory; it involves a peculiar exercise of the imagination. All that is directly *presented* to the learner by the teacher is a series of verbal sounds. In order that the meaning of these presented word-symbols may be *realised*, it is necessary for the learner to develop suitable and distinct mental images of the objects described. In other words he must imaginatively construct a suitable group of ideas.[1]

In order to illustrate this process of constructive realisation let us take the case of a parent or teacher describing a glacier to a child. She begins, we will suppose, by questioning him about his experience and previous knowledge of ice, mountains, and waterfalls. Here we see at once that the constructive process *sets out with a use of previously acquired images.*

At first only a vague "general idea" of the glacier is reached, say a big, big, frozen torrent; then, as fresh touches are added, this outline or "schema" of an imaginative representation becomes *précisé*, as the French say, that is, made definite by the incorporation of characteristic details. Thus the mental picture of the glacier grows more clear as the crevasses, the moraine at the side, and other details are described.

We thus see that the whole process of formative imagination is carried out by a modification, an adaptation to

[1] The student must beware of our misleading way of describing teaching as a *presentation of ideas.* This way of speaking is apt to blind one to the important differences between coming to know an object from direct inspection of it and from hearing a description of it. When a child follows a verbal description he does so by taking the presented matter, the words, and imaginatively interpreting them.

a new purpose, of ideas already possessed by the learner's mind; and further, that the gradual development of a distinct image proceeds by a series of *determinations*, *i.e.*, the transformation of a vague outline into a full, detailed picture. The process may be compared with that of the gradual differentiation of a germ-cell by segmentation into a number of unlike parts.

This last feature of the process is closely connected with the use of language. Words are, as we shall see presently, abstract symbols, and in order to interpret them pictorially the mind has, as Dr. Bain has it, to "*reduce the abstract to the concrete*". Thus, if I try to give to a boy an idea of Othello by saying that he was a big dark-skinned man with curly black hair, turban, etc., it is evident that I excite in his mind a number of general ideas corresponding to "big," "dark-skinned," and the rest. It is only by a sufficient combination of such verbal symbols that the learner is able to arrive at a *clear individual representation* of the object described. This same process of reducing abstract symbols to concrete representations is seen yet more clearly in following the verbal description of an unknown species of plant or animal.[1]

Here, as in other acquisition of knowledge, a double process of assimilation and discrimination is carried out. A child has to assimilate a description of an object, or a historical narrative, by mentally bringing it into its proper relations of *similarity* to his familiar experiences. It is well said by Lange that when a child transports himself

[1] On the nature of this imaginative process, see Lloyd Morgan, *Psychology for Teachers*, p. 7; and G. F. Stout, *Analytic Psychology*, Vol. ii., p. 267.

into the unknown and distant region of Bible History, there come "to the help of the new names certain familiar and similar notions". Goltz and others have shown how the childish mind spontaneously translates the new into the old, how he *apperceives* the new verbal presentation by help of familiar home experiences.[1]

But assimilation or apperception by help of pre-existing similar ideas, is not enough for *accurate* realisation. In following the description of a teacher, children, through the very necessity of going back to similar ideas, are very apt to import too much into their mental picture, taking up the particular associations with which their individual experience happens to have invested the words used. Thus Lange tells us that as a child he "pictured chaos to be similar to such a flood as was often caused by the Saale River, at a certain place, in the centre of which was a pond surrounded by gloomy lime and willow trees".[2] A child has a passion for reading the concrete facts of his experience into the descriptions and narratives he hears. Hence in order to an accurate grasp of meaning he has to be led to discriminate, to recognise the points of difference between the new and the old.

On the success of this imaginative effort depends to an important extent what is known as the *understanding* of the description. Understanding is exercising reason or thought, and is not the same as imagination, yet it is aided by the latter. If, for example, the imagination of a child, in following a description of an iceberg, does not represent, roughly at least, its great size,

[1] See Lange's volume, *Apperception*, p. 70 ff.

[2] *Op. cit.*, p. 72.

he will not be prepared to understand the dangers arising to ships from such a floating mass. Here we see the close relation between clear imagination and clear thinking, a relation to be spoken of again by-and-by.

(*b*) IMAGINATION AND DISCOVERY. The discovery of new facts and the laws which govern these is largely a matter of careful observation and of patient reasoning from ascertained facts and truths. Yet imagination has an important *rôle* here also. The inquiring, searching mind is always moving forward into the region of the unknown in the form of conjecturings, as—How would this substance behave if placed in such and such conditions? To guess a fact, whether it be a secret of Nature or a secret known to another, involves the bringing to bear on the problem of elements of our previous knowledge, and the making of various tentative combinations of these elements, until we feel we are getting near the desired solution. It is by such imaginative experiments that the student of Nature penetrates into her mysteries. What is called the "scientific imagination" implies first of all a good accumulation of knowledge to start with, and then a facility in inventing new suppositions or "hypotheses"—guesses as to this and that fact or law—which have afterwards to be tested or verified. A child shows a rude germ of this scientific capability when he tries by help of his previous knowledge to imagine how his toys are made, how the clock is put together and made to go, how the plants grow, and so forth.

(A) (2) IMAGINATIVE APPREHENSION OF INNER WORLD: MORAL DIRECTIONS OF IMAGINATION. The second direction of intellectual imagination concerns itself with the

facts of the inner life, with the ideas, feelings, longings of the mind. Knowledge of these facts underlies all that mutual understanding which makes social intercourse possible, all that we call sympathy, and, further, all the higher developments of the individual's moral character.

At first it might sound strange to speak of *imagining* another's forlorn hope, or passionate joy: imagination seems to have to do with things of sense. And it is no doubt true that when dwelling on the facts of inner experience we carry out a kind of process of abstraction, withdrawing our attention to some extent from the more impressive and more easily apprehended objects of sense. Hence the very slight amount of attention bestowed by children in general on these inner experiences. Still, to represent another's particular state of mind in a given set of circumstances is to apprehend a concrete fact, and is properly called an exercise of the imagination.

In this apprehension there is a true process of construction precisely similar to that by which external objects are apprehended. A child imagines how he would feel and act if placed in the position, say, of Prince Arthur in the Tower, by help of materials gathered from his own experience of confinement and despairing misery. There is here, too, a process of rearrangement directed to the formation of a clear and adequate idea, adequate, that is, to the purpose of understanding what is presented.

It is evident further that in this case also we have the distinction between a more passive process of apprehension and an originative process of discovery. This applies even to the apprehension of another's feelings, intentions, and so forth, by help of sense-observation. It

is comparatively easy for a child to read off the emotional signs of cheerfulness or "crossness" in a teacher; much more difficult to find his way to the fact by a process of imaginative inference from the teacher's actions. The same applies to those experiences which are presented indirectly by the medium of verbal description. In following an account of a pathetic story a child's imagination is moving obediently to the lead of the teacher's words; in "thinking" or imagining out how a particular historical or other person is likely to feel or act in given circumstances he is much more of a discoverer.

Closely connected with this imaginative apprehension of other minds is the *moral* direction of imaginative activity. Under this head may be comprehended the imaginative realisation of new states of feeling and desire so far as this furthers moral development. Thus it is an important moral exercise of the imagination when a child represents the results of a good or bad action. A large demand is made on the imagination, as we shall see later on, in all moral sympathy. A child develops morally by sympathetically realising others' feelings and mental states generally. Imaginative activity enters further into the development of new and higher forms of desire and aspiration. In youth, more particularly, the directions of desire and effort are largely swayed by *ideal representations*, the product of an ardent and intense imaginative activity carried out on material supplied by the character of teacher or other model—possibly some hero of history or fiction.

(A) (3) PRACTICAL CONTRIVANCE. A similar process of construction enters into the acquisition of the several practical aptitudes, such as the use of the voice in speaking

and singing, and all manual abilities, both mechanical and artistic. In developing any one of these practical abilities the learner is called on to reproduce what has already been learnt, and to recombine known elements in conformity with new circumstances and new needs. Thus in learning to carry objects to the mouth, and, later, to use the comb and brush, tools and so forth, a child re-adjusts previous acquisitions, fitting them to the new aim of the moment. Facility in carrying out such modifications of previously acquired ideas of movements and their results is what we call practical contrivance or inventiveness.

Here, again, we may distinguish between a receptive and a more original form of construction. Much of a child's motor acquisition is *imitative*, and so receptive. This is illustrated plainly enough in a large part of children's play, which is a mimicry of the serious actions of adults. The exercises of the school, such as singing, writing, the movements of drilling, and so forth, illustrate the same process. In all such imitative assimilation of movements certain new groupings of motor elements, new adjustments of means and ends, have to be learnt under the guidance of an external model or " copy ".

From this lower and receptive form of practical contrivance we must mark off the higher form of *free invention*. Children find out many new combinations of movement with little, if any, guidance from others. The desire to do something new in order to meet the needs of a new situation acts as a stimulus to the child's mind, exciting the memory-images of this and that action. By successive tentatives, in which the form of previous

movements is modified, an approach is, under favourable circumstances, made to the needed combination. All mechanical invention—that is, combining motor agencies in new ways so as to secure new results, as, for example, in inventing a new machine—illustrates the same mental process.

Much of this new constructive work is the outcome of the impulse of curiosity, the desire to find out about things. In other words, it is of the nature of *scientific experiment.* In this way the impulse to find out how to do things reacts on the more intellectual impulse to understand about things. A considerable part of a child's inventive activity, as when he rolls his ball, throws things into the water, and so forth, is motived by the experimental impulse, *the desire to see what will happen in certain circumstances.* Much of a boy's knowledge of things is thus gained experimentally, that is to say, by means of actively dividing, joining together, and otherwise manipulating objects.

(B) ÆSTHETIC IMAGINATION. Æsthetic Imagination is distinguished from the forms just considered in being subservient, not to the attainment of knowledge, whether theoretical or practical, but to *the satisfaction of feeling.* We illustrate this when we "day-dream," or let our imagination "go" for the pure pleasure which the sequence of images brings us. This illustration suggests that the unity of the constructive process is here due to the *control of a dominant feeling,* such as the love of the marvellous. It is under the influence of this dominant feeling that the mind selects its images, combining them in forms which best harmonise with, and so give full gratification to, the feeling.

Children's imaginative activity is very much under this sway of feeling. An imaginative child of four or six loves to build up a fairyland or region of romance, decked out with the brightest colours, and greatly surpassing in its beauty, its wondrous events and adventures, all that the everyday world presents.

Here, again, we may distinguish between a more receptive and a creative variety of imaginative activity. The former is illustrated in children's ready assimilation and enjoyment of fairy-tales and romantic stories. In this case the activity, though sustained by pleasurable feeling, is directed by the external form of the presented story. Where, on the other hand, a child invents a story for himself the whole process is freer, being determined merely by the feeling-tone of the images and their combination, that is to say, the impulse to produce something thrilling and intensely enjoyable. The highest form of this æsthetic creation is seen in the originative construction of the poet. Here we have a rich store of ideas, the product of fine and wide observation, and a careful process of selection under the guidance of a refined and trained taste. An element of intellectuality enters into the process in the shape of a regard for the truth of things, the preservation in the ideal creation of a certain verisimilitude.

Use and Abuse of the Imagination. It follows from what we have said that imagination has at once its proper use and value, and an accompanying danger. We have seen that imaginative activity is the source of pure pleasure, and is further an essential element in the process of moral development. At the same time we know that the "pleasures of the imagination" can easily be

indulged in to excess. A youth whose mind dwells too long and too intently on the exciting wonders of romance may grow discontented with his actual surroundings and so morally unfit for the work and duties of life. Or, what comes to much the same thing, he may learn to satisfy himself with these imaginative indulgences; and so by the habitual severance of feeling from action gradually become incapable of deciding and acting, a result illustrated by the history of Coleridge and other "dreamers".

Coming now to the intellectual aspect, we have seen that imaginative activity enters as an essential ingredient into the processes by which knowledge is reached. At the same time it is a commonplace that a very vivid indulgence of the imagination may lead to such an exaggerated realisation of the objects imagined as to give rise to illusion, as in the case of the dreamy child or novel-reader. In this way the boundaries of fact and fiction, the real and the ideal, are apt to be effaced. Even when the indulgence fails to produce this effect the habitual sway of the imagination by feeling is apt to give violence and capriciousness to its movements, and so to unfit it for the quieter and more serious quest of truth. It is a characteristic of strong feeling that it prevents a fine discriminating vision of facts, and leads to vagueness of view and to exaggeration. If, for example, a child is powerfully affected by the pathetic aspect of an historical incident, say the execution of Mary of Scotland, his mind, fascinated by this aspect of the event, will be unfitted to enter fully and impartially into all the circumstances of the case, so as to arrive at a complete understanding of the whole, and a just appreciation of the right and wrong of the action.

INTELLECTUAL FUNCTION OF IMAGINATION. The evils attendant on the more exciting and uncontrolled forms of imaginative activity have led many to think little of its intellectual value. Thus it has been customary to oppose the Imagination to the serious truth-loving Understanding. To the ordinary practical intelligence the imagination is apt to seem a useless ornamental appendage to the mind, serving, like the peacock's tail, only to retard its progress. Even writers on the human mind have followed the popular judgment so far as to form a low estimate of the intellectual services of imagination. Yet, while it is undeniable that imagination when subjected to the caprices of feeling is obstructive to the finer intellectual work, it is no less undeniable that in its calmer and more disciplined form it is a vital factor in the process of cognition. By far the larger part of our knowledge of the surface of our planet, of the past history of our race, of the inner world of human feeling and thought is acquired by strenuous exertions of imaginative activity. Learning through the medium of words is largely an imaginative process, imagination being aided by the activity of thought in the detection of the relations and connections of the facts imaginatively realised. Children of bright imagination are consequently better learners in general than unimaginative ones. Imagination remains, too, an integral part of intelligence in its higher and more impressive developments. A man of ready insight, quick to apprehend a new fact, a new situation, a new idea, is essentially an imaginative man. The greatest intellects, say those of the scientific discoverer and the poet, are imaginative intellects. We are justified, therefore, in treating of the im-

aginative process as an integral part of the intellectual processes.

Early Developments of Imagination. We found that the appearance of ideation under its simple form of reproductive imagination depends on a certain development of sense-perception and fixing of percepts. In like manner productive imagination depends on a certain development of memory, that is, the formation of a store of memory-images. A child must be able distinctly to recall his previous sense-experiences before he can build up anticipations of what is going to happen. Similarly it is only as he acquires distinct motor images corresponding to movements already carried out that he can construct ideas of new movements.

Beginnings of Imaginative Activity. An infant may be said to show a germ of imagination when he anticipates some new experience, as when something new is held out for him to take; yet it is not till language begins to be mastered that imaginative activity becomes clearly marked. It is in listening to the simple narrations and descriptions of the mother or nurse that the process of fashioning new images is first exercised. It is noteworthy that children only manifest interest in new stories after their minds have been first trained to follow verbal recitals of their own experiences. As M. Perez observes, a child of twenty months will delight in recounting his own little experiences, though he is not yet keen to hear stories (*First Three Years of Childhood*, p. 96). That is to say, production follows in the wake of reproduction. When once a child has attained to readiness in reproducing his own experiences he will display interest in new recitals. As Madame Necker ob-

serves: "The pleasure which the narration of the most simple stories affords children is connected with the vivacity of the images in their minds. The pictures which we call up in their minds are perhaps more brilliant and of richer colouring than the real objects would be." That their mental imagery is thus vivid, and that they realise what is narrated with great intensity, is shown in a number of ways, as, for example, in the impulse to act out the story, in the habit of returning to the story and talking about its characters and incidents, as also in the jealous concern for a strict fidelity to the original version when the story is repeated.

CHILDREN'S FANCY. After a certain amount of exercise of imaginative construction in this simple receptive form, children commonly show a spontaneous disposition to invent fancies of their own. This inventive activity of children's imagination is one of the most striking of their characteristic mental traits. It looks as if the impulse of creation prompting them to make something like what they have seen or heard, and the pleasurable excitement which comes from the first use of a new power, lead most children from about the age of three or four to throw much of their cerebral activity into this direction. Whatever the explanation the fact is unquestionable, and it is a fact with which the educator has to reckon. The crudity of the ideas put forth, the absence of well-arranged plan, and especially of a guiding sense of truth or probability, lead us to describe these early exercises of the imagination as the play of "childish fancy".

At first the activity of this childish fancy connects itself closely with the perception of actual objects. This connecting of the ideal with the real is illustrated in

children's play. Play is the outcome of a number of impulses, all strong in the early years, *e.g.*, the love of activity and the impulse of imitation. It is, moreover, a striking exhibition of the intensity and the vivifying power of childish fancy. When at play a child realises, by means of a lively imaginative activity which older people often fail to understand, the objects and situations which he is representing. The presence of a real object, the stick which serves as hobby-horse, the wisp of straw which does for a doll, supplies a basis of sensuous reality on which the imagination can the more easily construct its fabric. By the "alchemy of imagination," as it has been called, the stick or the wisp of straw becomes for the child more than half transformed into a living thing. It may have only the remotest resemblance to what is pictured; yet it is an object of sense that can be touched, and it serves as a *hint*, so to speak, of the glorious idea. Play thus illustrates in a striking manner the liveliness of children's fancy. In their spontaneous games they are always acting a part, making themselves believe that they are Indians, Robinson Crusoes, or what not. Under this aspect their play is akin to the acting of the stage, and has in it something of artistic invention.

This exuberance of imaginative activity shows itself commonly too in another form. A quite young child who has heard a number of stories will display great activity in modelling new ones. These fabrications show the influence of the child's own experience and observation as well as of the stories heard from others. At this period spontaneous fancy is apt to assume extravagant shapes. So common an object as a stone is treated as having sensation and feeling, or, if it happens

to have a hole in it, may be transformed into the dwelling-place of fairies. A strong susceptibility to the excitement of the marvellous and a childish love of what is odd and grotesque often supply the impelling force in these early productions. Young children are wont to project themselves in fancy to distant regions of space, and to transform themselves into all manner of objects. Thus a child barely three years old was accustomed to indulge in the pleasing fancy of living in the water with the fishes, of being a beautiful star in the sky, and so forth. The daring of these combinations is to a considerable extent accounted for by the child's ignorance of what is impossible and improbable. Judgment as to truth, and probability comes later, as the result of reflection on a wide experience. To the young mind to fly up into the sky is an idea which has nothing absurd about it.[1]

IMAGINATION BROUGHT UNDER CONTROL. The growth of knowledge and the development of the mental processes as a whole lead to marked changes in the activity of imagination. From the first spontaneous and lawless form, in which it is free to follow every capricious impulse, it passes into the more *disciplined* form in which it is controlled by an enlightened will. That is to say, its activity becomes more and more directed by the sense of what is true and probable. This process of development shows itself even with respect to fiction itself. As soon as a child gets a clearer idea of the general forms and conditions of human experience the old nursery tales cease to please. Stories, the action of which con-

[1] The characteristics of children's imagination are more fully described in my volume, *Studies of Childhood*, chap. ii. ("The Age of Imagination").

forms to the fixed circumstances and laws of real life, *e.g.*, histories of children, their doings and experiences, take their place. In this way the earlier impulses, such as the love of the marvellous and a feeling for the grotesque and ridiculous, are restrained by the addition of more intellectual motives, a desire to learn about things, and a regard for what is true to nature and life ; and this result is seen still more clearly in the gradual subjection of the imagination in all orderly processes of learning to the ends of knowledge and truth. As youth progresses, more and more of imaginative activity is absorbed in reading and learning about the facts of the real world.

LATER GROWTH OF IMAGINATION. While the development of the higher processes of thought tends in this way to restrain and guide the movements of childish fancy, it is a mistake to suppose that imaginative power ceases to grow. We are apt to attribute to children a specially high degree of imaginativeness just because we are struck by the boldness of their conceits, their remoteness from the familiar forms of our experience. Yet the same child who performs one of these "feats of imagination" would show himself very slow and inept, as compared with an educated adult, in constructing a clear mental representation of an unknown natural phenomenon, such as a Swiss mountain, or of a historical event. This suggests that what we call imaginative construction goes on developing with the gradual assimilation of the fruits of experience, as well as with repeated exercises in constructive activity. A precisely similar change takes place, as Mr. Herbert Spencer has shown, in the development of imagination in the race.[1]

[1] *Principles of Psychology*, ii., §§ 491, 492.

This higher development of the imaginative faculty implies an *increased facility in rearranging the elements of experience within the limits of the possible.* Thus by repeated exercises of the imagination a student of botany or zoology grows ready and skilled in the realisation of the description of a new plant or animal; and combinations of a greater degree of complexity than is possible to the child, as in representing the whole condition of England in the reign of Elizabeth, or the intricate action of *Paradise Lost*, become possible. In like manner the creative form of imagination grows more facile and comprehensive in consequence of a larger accumulation of experience-material, and repeated exercises.

Varieties of Imaginative Power. Different individuals differ in respect of their imaginative power no less markedly perhaps than with respect to their reproductive power. These differences, again, may roughly be marked off as general and special. A particular boy or girl may display superior constructive ability generally, being ready alike in representing new external scenes and sounds, new modes of human experience, and so forth. In most cases, however, excellence in imaginative capability shows itself in some special direction. Thus we meet among children with a specially good imagination now for visible objects, now for musical combinations, now for practical expedients. Still more special developments present themselves in the geographical, the historical, the geometrical imagination, and so on.

These differences depend partly on differences in native endowment and bent, with which we must reckon the innate germs of special interest, and partly on differences

in the surroundings, including the influence of the home and early companionship, and special exercise and training. Children appear to differ from the first in their constructive power as a whole: they have at the outset more or less of that cerebral endowment which underlies a ready breaking up and regrouping of experience-wholes. We can very early observe, too, that the imaginative activity, like the retentive power on which it depends, shows *a special bent*, corresponding to the natural superiority and more absorbing activity of a particular sense. One child may live imaginatively more in a world of sights, another more in a world of tones, and so forth. Special likings and interests, too, have much to do with fixing the particular lines of imaginative development followed out. A strong natural liking for the observation and the discovery of nature's phenomena leads a boy to exercise his imagination in relation to these, whereas the direction of feeling towards the beautiful aspect of things would give to the imagination more of an artistic turn.

While in this way the differences observable in children's imagination are in part predetermined by natural aptitude and feeling, the influence of surroundings and of education is a considerable one. Systematic training will never succeed in developing in a naturally unimaginative child a fine faculty of imagination, yet it may materially improve the power, and even raise it to the height of a fairly good aptitude in some special direction.

MEASUREMENT OF IMAGINATIVE POWER. It is not easy to devise means for an accurate measurement of imaginative power. Mr. Galton's researches on the ability to "visualise" familiar objects, as the breakfast-table, have to do merely with reproductive imagination.

Children might be roughly tested as to the readiness and exactness of their imaginative construction by being asked to draw, and also to give a short verbal re-statement (in their own words as far as possible) of, an object, scene or action which has just been described to them. A methodical questioning of them as to how their minds envisage the object would be helpful here. The imaginative power might further be tested roughly by encouraging story-inventions.

Constructive activity in special directions and under a particular set of conditions may be tested. Thus Professor Ebbinghaus has devised the ingenious experiment of setting school children a piece of defective print, in which syllables and whole words are wanting, in order to see how quickly their minds can fill in the gaps, so as to reconstruct an intelligible whole. Practical constructiveness, or inventive ability, can much more readily be estimated.

EDUCATIONAL CONTROL OF IMAGINATION.

Training of the Imagination. The notion that the educator has a special work to do in exercising and guiding the imagination of the young is a comparatively new one. The common supposition of the inutility, not to say the mischievous nature, of the faculty has naturally led to the idea that if education has anything to do with a child's imagination, it is solely by way of repressing its activity. It is to be hoped, however, that a clearer apprehension of the scope of imaginative activity, and the important part it plays in the work of the intellect, will turn teachers' attention more and more to the problem of developing it.

As has been pointed out above, the imagination, in the undisciplined form of childish fancy, is a precocious faculty. Children often show a liveliness and a daring in their fancies which astonish their elders. This precocity of productive activity points to the need of an educational discipline of it in the early stage of mental development.

Twofold Direction of Imaginative Training. The peculiar nature and connections of the imaginative process, its relation to intellectual activity on one side and to the play of feeling on the other, give rise to educational problems of peculiar difficulty. The teacher must it is evident, keep in mind the several functions or uses of this mental aptitude if he would assign it its proper place in a systematic plan of education. Yet he must no less persistently keep his eye fixed on the dangers of unbridled fancy.

(*a*) Restraining Fancy. Beginning with the latter aspect, we may say that the educator has to exercise to some extent a negative or repressive control over early imagination. He will do well to remember that, as Miss Edgeworth observes, imagination, like fire, "is a good servant but a bad master". Owing to the ignorance of children about nature and life, and their natural disposition to fear, the possession of a lively imagination, leading to an intensely vivid realisation of the stories related to them, exposes them to special dangers. Locke and others have shown how dread of the dark and other miseries of childhood spring out of a perverted imagination. In many cases at least stories about hobgoblins and other gruesome figures may excite children's imagination to a pitch which is morally dangerous and even disturbing to health. The tendency of their mind to accept as real all that is imagined shows itself in the effects of their dreams, which are apt, especially in the case of nervous and sensitive children, to take a dangerous hold on their minds. The educator should remember too that by suggesting to an imaginative child a certain idea, he is apt to arouse imaginative

activity and produce belief in its reality.[1] All this goes to show that those who have the care of young children should take pains to ward off too exciting and especially painful fancies, and to avoid carelessly suggesting these. Not only so, a tendency to be mentally absorbed in "the pleasures of imagination," more especially those of day-dreaming, should be corrected by calling forth the activities of the child's mind in grappling with real facts, and in carrying out interesting and useful kinds of work.

In this curbing of childish fancy, however, much discriminative judgment is needed. Certain writers on education appear to over-estimate the evils of imaginative indulgence when they suggest that it were well to shut out the realm of fiction altogether. It may be said that the creation of a supersensible world, the glorious realm of fairyland, is natural and appropriate to childhood. It is the source of much pure delight, and the fond illusion which enters into it tends in ordinary cases to disappear with so little sense of conflict that its harmful effects become inappreciable. It is only in special cases, where there is a dangerously lively fancy and a too absorbing occupation with the imaginary world, that a decided interference on the part of the educator is called for.

(*b*) Cultivating the Imagination. While the educator has thus to check the activity of youthful fancy in certain directions, he has also an important function to

[1] This has been illustrated by the fact that children of abnormally vivid imagination tend to believe that they have actually seen what has merely been suggested to them by another's words. See Motet's curious work, *Les faux témoignages des enfants devant la justice.*

discharge in aiding to develop it. In truth, as Madame Necker tells us, " we only restrain the imagination when we exercise it". We do well to remember that the playful activity of the fancy at this early period is valuable as a preparation for the serious intellectual work of later years. Just as the infant's plump unformed hand, by its seemingly idle and purposeless manipulations of whatever comes within reach, is acquiring strength and precision of movement for the labours of after-life, so the imagination develops into a strong and flexible organ by what are apt to seem to older people foolish indulgences.

In this cultivation of the imagination the educator has to direct its activity into healthy channels, and to subject it to the discipline of a methodical procedure. The narration of a good story in a clear, orderly manner constitutes a disciplinary exercise. Such exercises, which should be carried out in the home before school-discipline begins, train the young mind in fixing the attention and in following out steadily, and progressively realising as a whole, a series of representations. The early culture of imagination by such simple exercises in the home is a necessary preparation for its later and more difficult work in the school.

In this training of the imagination we must attend to the natural laws of the process. Thus the educator should take care that the child has the requisite stock of memory-images, and should begin with comparatively easy exercises, involving simple ideas (that is, ideas made up of few elements) and ideas closely related in their whole form as well as in their constituent parts to childish experiences and observations. A child may well be

called on to picture mentally a snow mountain, because he has seen the snow and some hill, or at least a picture of one, and can, moreover, easily combine the two by help of some analogous observation of his own, *e.g.*, the roof of a house with snow on it. On the other hand, it would be foolish to expect a child to imagine so complex an idea, one so remote from childish experience, as the view of mountains and lakes from the Righi.

The close connection between vivid imagination and feeling makes it desirable in the early stages to appeal to childish feeling. The subject to be pictured out by the young mind must be pretty, amusing, pathetic, or otherwise fitted to rouse a keen childish interest.

All this suggests that in spite of the attacks made on them, the established favourites of the nursery, fairy-tales and stories of all kinds, form, by their much stronger appeals to childish feeling, the best beginning in the culture of imagination.[1] In order to secure this educational value of stories, however, a wise selection must be made. A good deal of so-called children's literature is not only morally bad (bad, that is to say, in respect of its moral tone), but is unsuitable. It is written too much from the grown-up point of view, and in ignorance of children's feelings and likings.[2]

Exercise of the Imagination in Teaching. Although, however, fictitious story forms a valuable means

[1] The fact is clearly discerned by Isaac Taylor in his judicious remarks on the use of fiction, *Home Education*, chap. ix., p. 260 ff.

[2] This has been clearly pointed out by Mr. E. V. Lucas with respect to a good deal of the poetry which is said to be suitable for children. See his excellent article on "Some Notes on Poetry for Children" in the *Fortnightly Review*, September, 1896.

of cultivating the imagination at first, it needs to be followed up by that higher kind of exercise which is involved in acquiring real knowledge. All oral teaching, as we have seen, proceeds by an appeal to the child's imagination. This is apparent even in the beginnings of teaching. An intelligent parent who talks to his child about the wonders of nature, such as the formation of clouds and rain, the movements of the earth and the stars, is continually calling forth the learner's imaginative activity. All teaching, too, of the facts of human experience, including the thoughts and actions of the wise, the great and the good, opens up another wide and attractive arena for the exercise of the imagination.

As already suggested, there is a special value in this exercise of imaginative activity as an ingredient in the process of acquiring real knowledge. The necessity laid on the young learner of mentally apprehending and understanding certain determinate realities disciplines the imagination to a careful methodical line of activity. It is called upon to move along a definitely prescribed path, to make sure of a particular combination such as subserves the understanding of what is presented.

The conditions of a wise and efficient exercise of the imagination can be illustrated best of all by a reference to those comparatively concrete branches of knowledge which make a specially large appeal to this form of mental activity. I refer to History and Geography, in which it is more especially exercised, and where, consequently, a knowledge of the laws of its operation will be a matter of great importance to the teacher.

The first thing the teacher has to attend to in such teaching is *the form of presentation*. A suitable form

implies a careful selection of the medium of presentations, *viz.*, the language used. This must at once be intelligible and forcible in point of suggestiveness. The imaginative activity of a child is most effectually evoked by simple, thoroughly familiar, and, as far as possible, unambiguous words, so that the required ideas and combinations of ideas may be called up instantly. The teacher should remember that a child easily misapprehends our words, and more especially is prone to put too much of his own observation into them.[1]

In connection with this clear intelligible use of words, the teacher should *take the child's mind back to its own past experiences*, should remind him of facts in his experience, the recollection of which may contribute to the production of a distinct idea of the place, scene, or event. Thus in describing an historical event the several features should as far as possible be related to analogous events in the child's small world. This requires a good deal of knowledge both of children's experience and of the workings of their minds. In thus utilising the child's own experiences, however, the teacher should be careful to help him to distinguish the new from the old, and not to import into the idea-formation any accessories of these experiences which for the purpose of the lesson are irrelevant and misleading. A teacher who had been giving a lesson on Homer to a class aged about thirteen, in which she had spoken of the old blind poet as wandering from place to place, was amused at finding one of her pupils afterwards translating the story into terms of everyday experience by de-

[1] Illustrations of such misapprehension of words are given in my *Studies of Childhood*, p. 183 ff.

scribing Homer as "going *about the streets* singing". The perfect avoidance of such erroneous assimilation of the new to the old would require a perfect knowledge of children's minds.

Once more, the teacher should *follow an orderly plan of description* corresponding with the natural mode of working of imaginative apprehension. He should remember that *all knowledge develops by stages from a vague to a definite form.* In imaginative construction the learner's mind begins with a rough outline or general scheme, which gradually grows distinct by the addition of individualising features. Thus the description of a river, of a coast line, and the like, best begins with a general account of its situation, size and shape, and then proceeds by a detailed account of particulars. Similarly, historical narration, as in describing an event such as the defeat of the Spanish Armada, does well to prepare the mind of the learner by a short general statement of the subject with a reference to the more essential circumstances of the time, which statement supplies to the child's mind a general *schematic form of idea* which can afterwards be developed by an orderly unfolding of the detailed parts of the occurrence into a precise and accurate form.

Again, in successively unfolding the different parts of such a complex subject as the history or geography of a country, that order should be followed which is most favourable to imaginative activity. Thus the progress should be, so far as possible, from the known to the unknown. In geography, for example, the teacher, after a brief elementary account of the earth, starts with the child's own locality, and working out from this opens up

little by little distant and unfamiliar regions of the earth's surface, where the natural features and types of human life are widely different.

Again, in adapting such lore to the needs of childish imagination, the teacher should take up what is relatively simple and easy before proceeding to what is more complex and difficult. Thus the first instruction in history should be unsystematic, by way of selected narratives or "stories," and the full and more systematic study—which besides involving more difficult processes of imagination makes a heavy demand on general thinking—reserved for a later stage of development. The teacher should remember, too, that feeling is the life of imagination, and that in teaching a subject like geography the child's love of adventure and story may at first be best appealed to by connecting description with a narrative of some real or imaginary journey, its adventures, dangers, etc.[1]

Finally, in all this teaching of the concrete by way of verbal description the imagination of the learner should be assisted by *a judicious use of sense-presentations.* The important aid rendered to the child's imagination by the sight of a globe, a model of a river-basin, and in a less degree by a good map, is recognised in modern methods of teaching geography. The advantage derivable from these appeals to the eye is due to the circumstance that the products of imagination never, even at their best, attain to the completeness and distinctness,

[1] In Sir Joshua Fitch's valuable chapters on the teachings of geography and history (*Lectures on Teaching*, chaps. xii. and xiii.) the reader may see these points illustrated. *Cf.* I. Taylor, *Home Education*, p. 255 *et seq.*

the steadiness and the representative sufficiency, which characterise a sense-percept. Seeing an object itself is worth a hundred descriptions of it, both for the formation of a clear idea, and for the understanding, of the thing. When an object is presented to his senses a child's mind cannot go far wrong, and he is certain to gain some accurate knowledge of it if only he attends and examines. When, on the other hand, it is merely described and has to be imaginatively constructed, a child is thrown much more on his own resources, and is exposed to all the misleading forces of language.

It is to be remembered, further, that verbal description necessarily proceeds by presenting the parts of an object or a scene one after the other, whereas the imagination requires to bring these together in a single picture. The model or map aids the learner's mind by presenting the parts simultaneously side by side just as a keen-sighted bird might see them.

A similar aid is rendered to the historical imagination by the sight of coins, old buildings and the like, all of which make direct appeal to sense-observation. Much more use might be made of such relics of the past in the teaching of history and of literature, especially where, as in London, these legacies are so rich and so readily inspected.

Lastly, it is to be remarked that a good picture, though of course inferior to the object itself in certain respects, since it gives only two dimensions of space, and can represent only one side or aspect of the object, serves as a most valuable sensuous basis for clear and vivid imaginative activity. It is able to present the appearance of a particular moment, *e.g.*, of a battle, with great clearness

by reducing the scale and so bringing the several parts conveniently together for the eye, and is really more helpful to a clear apprehension of the whole than would be the actual witnessing of the scene.

Yet while pictures have thus a real use in education, they have too their characteristic dangers. To begin with, a picture is an abstract, and in a sense a falsifying representation of a material thing. How hard it is for children to catch the true representative meaning of a picture is seen in the errors they commonly make at first as to the real size, shape, and distance of the pictorial objects. Not only so, a picture when it represents life and action falsifies by excluding movement, and a child is apt to be puzzled at seeing the huntsmen, for example, mounted on their galloping horses, yet remaining fixed on one spot. While pictures are thus apt to be a puzzle in the early years before they are understood, they are apt to mislead older children, especially when the things represented are unfamiliar; all of which shows that care is needed in selecting pictures as illustrations, and that merely showing a picture to a child without explanation is but a very poor substitute for showing the real object itself.[1]

CULTIVATION OF INVENTION. As we have seen, a child uses his imagination not only when he apprehends and assimilates another's instruction, but when he himself discovers knowledge. And educators since Rousseau's time have begun to recognise the desirability of now and

[1] On the *naïf* mental attitude of a little child towards his pictures, see my *Studies of Childhood*, p. 309 ff. The educational use and abuse of pictures are well illustrated by Mr. H. Courthope Bowen in a lecture, "On the Use of Pictures in Teaching," published in the *Journal of Education*, October, 1895.

again carrying out the "self-denying ordinance" of allowing children to find things out for themselves. In the teaching of natural history, of geography, of history, of science, opportunities occur for encouraging children to develop unaided the knowledge already acquired to new and unsuspected results. Here we have to do with a process of thought, *i.e.*, of reasoning from the known to the unknown. Yet this process of reasoning is rendered possible by, and may be said to grow out of, imaginative activity. Thus the child that is able to reason where the brown peat-tinted water comes from, or what would happen if England were to lose all her coal-fields, is a child who can readily *imagine or picture out the particular surroundings, antecedents, and consequents of facts and suppositions.* And education can render no greater service to a child than to develop this power of ready imaginative invention.

Here, however, great judgment is needed. It is no doubt true that much mediocre teaching of to-day (like much mediocre art) sins by leaving too little to the imagination; children are only bored by being told what they are perfectly well able to find out for themselves. The new questioning method of teaching which is becoming firmly established in secondary as in primary education (in girls' schools at least, where trained teachers are obtainable) is of the very highest educative importance. Yet errors are made in this mode of teaching also. It is very easy for an inexperienced teacher to expect too much from a child; and some of the questions "shot off" in this questioning method miss their mark by calling forth no *definite line of responsive imaginative activity.* You must know how much latent know-

ledge is in a child's mind, and, further, the precise attitude and directions of activity of this mind at the moment (as determined by the immediately preceding instruction), if you are with unerring tact to put the apposite and fruitful question, the question which fully starts the activity, that is already on tip-toe, so to speak.

CULTIVATION OF OTHER DIRECTIONS OF IMAGINATIVE ACTIVITY. A word or two must suffice on the relation of the educator to the other forms of imaginative activity distinguished above. The cultivation of the imagination in the apprehension of facts of the inner world is beset with special difficulties. It is much easier for a child to picture a sensible object than to represent another's state of feeling or process of reflection. Not only so, a child's experiences, his ideas, feelings and desires, differ profoundly from those of older people, so that it is hard for him to enter imaginatively into these. Great care must be taken to select simple experiences such as can easily be imagined by help of analogies to the child's own experiences. For the rest, the same general principles which regulate the exercise of the imagination in the process of acquiring knowledge of external objects apply to its exercise in the other directions of its activity. Thus in describing facts of the inner world, such as the feelings, ideas, and aims of a historical character, care should be taken to present the facts in simple, easily apprehended language, to go back upon simple experiences of child-life so as to secure the requisite materials, and to point out all discoverable analogies between the situation and state of mind described, and those which arise within the narrower circle of childish experience. Here, too, it is of importance to proceed methodically, to begin,

say, an account of King Alfred's adventure at Athelney with a general account of the circumstances and the situation of a fugitive sovereign in disguise, and then to develop a more exact imaginative apprehension by a skilful selection of the detailed facts. Opportunities should be seized here, too, for encouraging a more spontaneous discovery of the facts : as by asking how a king would be likely to feel and behave when driven to assume the guise of a labourer, and perform the menial work of cooking.

It is much the same in educating the practical imagination. A child when invited to carry out any process of manual construction should be led to see the resemblance between the new task and old ones, to note what is familiar both in the general plan of the work and in its constituent parts, and at the same time to observe carefully in what respects the process differs from those previously carried out. Further, he should be trained to make use of his first inaccurate tentatives to produce the desired result, so as to correct his errors, and thus gradually to approximate to the right combination of ideas. The simple exercise of forming a new letter illustrates all these conditions. Ample room must, moreover, be provided for a freer construction, partly by the selection of toys—such as a box of bricks, or what Jean Paul Richter held to be the best of toys, a heap of sand—which offer an indefinite scope for constructive invention, partly by introducing into the methodical work of the kindergarten or school opportunities for inventing original designs.[1]

[1] The cultivation of mechanical contrivance in children is well illustrated by Miss Edgeworth, *Practical Education*, i., p. 33 ff.

The cultivation of the æsthetic imagination is in the main similar to that of the intellectual: the chief difference being the cultivation of a finer feeling for what is æsthetically fit, harmonious, and contributory to a total impression of beauty. This will be dealt with later on.

REFERENCES FOR READING.

For a fuller psychological account of the process of Imagination the following may be consulted: Sully, *The Human Mind*, chap. x.; G. F. Stout, *Analytic Psychology*, vol. ii., chap. xi., sections 10 to 12.

The characteristics of children's Imagination are dealt with by Sully, *Studies of Childhood*, chap. ii.; by B. Perez, *First Three Years of Childhood*, chap. ix., and *L'Enfant de trois à sept ans*, chaps. iii. and iv.; by G. Compayré, *The Intellectual and Moral Evolution of the Child*, chap. vii. The reader of German may further consult Pfisterer, *Pædagogische Psychologie*, sect. 14, and the article "Phantasie" in K. A. Schmid's *Pädagog. Handbuch.* The differences of imaginative power among children are treated of by F. Queyrat, *L'Imagination et ses variétés chez l'enfant.*

The educational importance and the culture of the Imagination are dealt with very fully by Isaac Taylor, *Home Education*, chaps. ix. and x. ("Culture of the Conceptive Faculty"). *Cf.* Miss Edgeworth, *Practical Education*, chaps. xxi. and xxii.; Rosenkranz, *Pæd. as System*, p. 42 ff., and Lloyd Morgan, *Psychology for Teachers*, chap. ix. ("Literature"). In French literature one may recommend Mdme. Necker, *L'Education*, livre iii., chap. v., and livre vi., chaps. viii. and ix., and more recent manuals, *e.g.*, that of Compayré, *Cours de Pédagogie*, leçon xi., and of E. Rayot, *Leçons de Psychologie*, onzième leçon. The reader of German may profitably consult Beneke, *op. cit.*, sects. 23 and 24; Waitz, *op. cit.*, sect. 10 (*Vom Spiele*).

CHAPTER XII.

THOUGHT-ACTIVITY: (A) CONCEPTION.

NATURE OF THOUGHT.

Knowledge of the Particular and of the General. We have hitherto examined the processes by which the mind apprehends particular objects and events. In perceiving and imagining we have to do with individual things, as they can be known by way of the senses. But we can have another kind of knowledge about things, we can *think about them*, and this means that we can apprehend their constituent qualities, and by comparing them one with another in respect of these qualities reach *general ideas* of them. For instance, I can not only perceive this particular river, the Thames, which flows at my feet, but I can think about the essential properties of a river, and so about rivers in general. The latter gives rise to the knowledge of the General and Abstract, as distinguished from that of the Particular and Concrete.

Thinking, in the sense just defined, is closely related to Understanding, and indeed the two words are often used to mark off the same higher region of intellectual activity. When we view an object as a concrete whole we merely *apprehend* it: when, however, we specially note certain of its characters, recognising these as the common characters of a class of objects, we *comprehend* it. Thus a child merely apprehends a wild flower when

he perceives it as this particular object growing at this particular spot: when, however, he notes certain characteristics of it like those seen in other flowers, and names it a dandelion or what not, he has comprehension of what he sees.

While, however, we thus broadly mark off this higher level of general knowledge from the lower level of particular knowledge, we must not suppose that they are absolutely distinct one from the other. We have already seen the beginnings of thought-activity in the process of sense-perception itself. To see and discern an object is to make prominent in consciousness its more characteristic and important features, qualities, and relations (see above, p. 197). What we call *general knowledge is thus only a further development of particular knowledge at its best and clearest.*

At the same time, this process of development is one which requires for its realisation very special conditions. For one thing, as has been pointed out, such explicit thought-activity presupposes a certain development of the highest brain-centres (compare above, pp. 40, 41). Not only so, all thinking, of the more explicit and exact sort which we are now considering, involves a very special and disciplined form of *voluntary attention*, which, again, implies the influences of human culture, as we see these at work in a civilised community.

Elements of Thought-Activity: (*a*) Analysis: Abstraction. Thought-activity consists essentially in a new and more difficult exercise of voluntary attention in relation to percepts and memory-images. To think is to carry out a very special kind of mental effort, that is, concentration of attention.

The simplest form of this thought-activity is seen in that *analysis of our percepts* by which we separately attend to this, that, and the other quality or relation of an object. A child begins to think when he singles out for special consideration, say the colour of a rose, the length of the neck or of the legs of a giraffe. Such an analytical selection of a particular feature throws, as we have seen, the other features into the background of consciousness. In attending to the colour of a rose a child has only a vague "marginal" impression of the form and number of its petals, the thorns on its stem, etc. Hence we may say that the analytical selection of particular qualities and relations of things is always a process of *abstraction*, *i.e.*, a mental rejection of, or turning away from, what is not material at the moment.[1]

Now, as we saw above, a child's natural way of looking at and recognising things is by regarding them as *concrete wholes.* In perceiving and recognising an object, say an orange or a rose, he does not selectively attend to any one of its qualities, even the highly interesting one of colour. Strictly speaking, he apprehends a *thing* merely, and cannot as yet resolve this thing into a cluster of qualities. To fix the attention on any quality or relation as such, and in isolation from the other connected qualities, is the result of a special *effort of thought.* When we talk about abstraction and its difficulties we are thinking of this effort, of the labour of substituting for the unanalysed view of the whole the view of its constituent qualities and relations.

[1] Etymologically abstract (Latin, *ab* and *traho*) means to *draw off*, *i.e.*, the attention from certain aspects of an object so as to concentrate it upon another.

(*b*) SYNTHESIS: COMPARISON. Along with this work of resolving concrete wholes into constituent qualities and relations thought-activity proceeds by synthesis, that is to say, the combination or integration of thought-elements into wholes. We saw that this process of synthesis enters into the more explicit form of perception as a clear grasp of a peculiar group of qualities constituting "this object".[1] We have now to examine more generally this form of thought-activity.

The essential process in Synthesis is Comparison. By this is meant the *successive direction of attention to each of two (or more) presentations or ideas in order to see how they are related.* In this way, for example, I compare two pictures on the wall to see whether they are on the same horizontal line or two colours to see which of the two is the darker shade.

All clear apprehension of relations implies comparison. Thus the spatial relations of two objects, *e.g.*, the situation of one star to the right of, or above, another, are clearly discerned only by movements of attention from one to the other. When, however, we talk about comparison as an integral part of thought-activity we are especially referring to the two great relations which lie at the basis of all the others, *viz.*, Similarity and Dissimilarity or Difference. Comparison is illustrated in all explicit apprehension of difference and contrast. It is by comparison that a child grasps simple contrasts, such as white and black, tall and short, good and bad, and so forth. In like manner it is by comparison that he explicitly grasps a relation of similarity, as, for example, that between a picture and the original, or a

[1] See above, p. 197.

tiger and a cat. *To compare two things is to discover, by mentally focussing each in turn, whether and in what respects they resemble or differ from one another.*

The student must carefully distinguish between an *implicit* awareness of difference or likeness and comparison proper. A child "discriminates" the dog from the cat long before he can compare his percepts so as to see *how* they differ. In like manner he likens or "assimilates" one object to another, as in calling bright things generally after the bright object, "key" or "star," before he can compare these so as to detect the real point (or points) of similarity. The first kind of activity is on the level of sub-human or animal intelligence, the second is distinctively *human* activity.

Relation of Comparison to Abstraction. These two fundamental forms of thought-activity are closely connected. No proper analysis of our percepts is possible till comparison begins. As every teacher knows, a child cannot at first single out in an object a particular quality or relation, say the straightness of a line. He must first observe *a number of* lines, and have the element of straightness brought home to his mind as a common feature in otherwise dissimilar objects. A child does not apprehend even so obvious a quality as the blackness of coal until he has seen a variety of black objects, and carried out a rudimentary process of comparison.

We may say then that *there is no complete process of abstraction, no clear marking off of the quality or relation of an object as such, without some amount of mental juxtaposition of this object with other objects resembling the first in possessing the same quality or relation.* This is perhaps one of the most important principles which psychology supplies to the educator.

While, however, a rudimentary process of comparison is thus present in all abstraction, it is no less true that

all the higher and more exact comparison of things is aided by abstraction. Thus, for example, if a child is asked to compare two lines as to their straightness, it is evident that he can only carry out the comparison by following the lead of the word "straightness," specially fixing his thought on this particular aspect. The later and more exact comparison is thus greatly aided by the results of previous abstraction (*e.g.*, that involved in acquiring the notion "straight").

We may then describe the movement of thought as follows: a child begins by a vague general comparison of things, by help of which he discerns their several points of likeness, and so analyses them into constituent qualities; after this analysis has been carried to a certain point its results enable him to compare objects more narrowly and precisely, that is to say, by fixing his attention at the outset on some common aspect, such as shade of colour or squareness of angle.

STAGES OF THINKING. It is customary in dealing with the thinking processes to distinguish successive stages. (*a*) First of all, it is said, thinking requires as its element a "general idea," such as is set forth by the name "man". All general ideas when rendered clear and accurate, as logic requires them to be, are known as "concepts".[1] Such are the scientific ideas embodied in the terms "material body" and "weight". The process by which a concept is formed is called Conception. (*b*) When the mind possesses concepts it can carry out a complete act of

[1] As we shall see presently, notions or concepts may be either of what is constant and universal in a number of presentations of the same object, or what is common to the presentations of a number of different objects.

thought by combining two concepts in the form of a "proposition," as when we say "material bodies have weight". This is termed an act of Judgment. (*c*) Lastly, after judgments have been formed the mind carries out a more complex process of thought by inferring from the truth of certain judgments to that of other judgments, as when from the propositions "material substances have weight," "gases are material substances," we proceed to the new proposition "gases have weight". This process is described as Reasoning, or drawing an inference or conclusion.

The student must bear in mind that these distinctions are drawn by the Logician, rather than by the Psychologist, as *formal distinctions* recognisable in matured thought. They do not properly stand for successive stages in the growth of thought. A child does not form concepts before he begins to judge, and judgments before he begins to reason. With this warning we may adopt the distinctions as convenient for purposes of exposition.

THE GENERAL IDEA AND CONCEPT.

Definition of General Idea. The general idea embodied in a name, such as "man," "triangle," lies at the basis of all the higher and scientific kind of thinking. We only think comprehensively and exactly by help of clear general ideas or concepts. In other words, *the higher and more perfect kind of thinking is conceptual thinking* (*i.e.*, thinking by means of concepts). Hence we have to begin our examination of the thinking processes by an inquiry into the structure and mode of formation of the general idea.

A general idea is best marked off as an idea used with

a general import or signification. Thus a child has a general idea of "house" or "father" when he knowingly uses the name as one of general scope, as being applicable to any and every object having certain recognisable features or qualities, or holding certain relations; or, to use the language of logic, we may say that a general idea represents the common features of a *class of objects* as distinguished from that more special group of features which constitutes an individual object.[1] As we may infer from these examples, a general idea is closely connected with the possession and use of names or other general signs. If we had no general signs such as names (or the gesture signs used by deaf mutes) we could have no precise and stable general ideas. General or conceptual thinking thus depends on an intelligent apprehension and use of language.

The General Idea and the Image: Generic Images. The general idea is clearly related to the memory-image. When I think about houses in general my idea resembles the memory-image of a particular house. In truth, it is evident that our general ideas are formed out of memory-images. We have now to trace the process of development by which they are formed.

The first important step in the direction of general ideas is the formation of what is called the *generic image*. A generic image is a pictorial mental image of a composite character formed by a succession of strik-

[1] The student must be careful to distinguish the logical meaning of "class" from that of the same word when applied to a definite number of objects, as when we speak of a class of children in a school. The scientific or logical name "class" knows nothing of number. It includes every object *of a certain kind.*

ingly similar presentations and acts of recognition. Thus after seeing the mother or the nurse, again and again under different circumstances, in different lights, and what is more important, in different clothes, a child forms a composite image of the person. In this composite image the constant, regularly recurring features are brought into prominence by the process of assimilation, which at once seizes, so to speak, on any elements in new presentations which cause them to resemble old presentations (compare above, p. 172). And, further, these common features are marked off by the use of the same name (*e.g.*, "Mamma," "Nana"). This becomes definitely associated with the composite image so that when the mother says "Nana" the child has a pictorial representation of the nurse's general appearance. Such a representation may be called the *composite generic image of an individual.*

What is usually spoken of as a "generic image" is formed out of presentations of *a number of similar objects.* For example, a child sees at different times this, that, and the other dog. The features in each new presentation (answering to the general appearance of a dog) are here, too, specially attended to in the process of assimilation. Here, too, one and the same verbal sign, a general as distinguished from a singular or proper name, is used in recognising each new presentation in this series (*e.g.*, "Bow-wow"). In this way there comes to be definitely associated with this verbal sign a generic or typical image of the common form of the dog. Thus when the mother or nurse says "Bow-wow" this generic image would be called up in the child's mind.

Such generic images do not, however, in themselves amount to true general ideas. A child understands and

even uses general verbal signs, such as "man," "dog," before he has a clear awareness of *the generality* of the sign. This process of generalisation, as it is called, that is to say, the clear recognition of *a certain group of features as common to many things*, comes later as the result of thought-activity proper.

CONCEPTION PROPER OR GENERALISATION. Conception proper begins with reflective comparison and analysis carried out upon generic images. Thus a child begins to understand the sign "dog" in its general character when he goes back in reflection on his past observations, recalling the differences between this and that presentation, and carefully separating out by analysis the points of likeness from those of difference.

By these processes he at once comes to have a clearer idea of an *individual* as such, and of a *class of things.* A baby using "da-da" as a recognition sign for all bearded men has no clear awareness either of an individual object or of a generality or class of persons. His state of intelligence seems to be on the level of a cat which does not distinguish between the human form in general and individual embodiments of it. His experience presents to him again and again certain similar features surrounded by dissimilar ones. Thus his own father may appear with his beard shorn off, in which case a striking change, that is, difference, presents itself in a recurring and familiar kind of presentation. It is only slowly and by much reflection that a child comes to know that it is one and the same object which presented itself with and without the beard. Closer attention to what we call the signs of sameness, the real abiding characteristics of the individual, a dawning apprehension of the fact that in-

dividual things continue to exist, and can always be found in the same place (save where they move or are moved), lead gradually to the formation of an idea of *the same individual*, persisting in spite of certain changes. This is what logicians call the *concept of the individual.* An intelligent dog, devoted to his master, probably has the rudiment of such a concept in his idea of this person.

Concurrently with this process, and in close connection with it, the child notes by comparison and analysis the *generic* as distinguished from the *individual* characteristics, such as the distinctive physiognomy, dress, pitch of voice, etc., of the class which we should call "adult human male". When this process is complete he is said to generalise, that is, to apprehend certain elements in things as common to many, and as forming the basis of a class. In other words, he has attained to *the concept of a class as distinguished from the concept of an individual.*

THE FUNCTION AND VALUE OF NAMES IN CONCEPTION. As we have seen, a general idea is an idea fixed and embodied in some name or other general sign. How far a child's mind can travel along the path of generalisation without any use of general signs is a disputed point. It is probable, however, that all clear and precise thinking depends on the use of them.

Names are, as remarked above, a valuable aid to memory. Memory-images are called up to a large extent by means of language.[1] But names are not merely useful as reminders; nor does their chief use lie (as is sometimes said) in their economising the labour of

[1] See above, p. 257.

memory. Their real function is found in connection with the processes of thought.

This function of names in thinking is definitely to fix the products of our thought-activity. Thus the terms "red," "crooked," and so forth definitely mark off and register for further use the knowledge of particular qualities discovered by analysis. In other words, *names are a device by which we can artificially isolate and keep apart the results of our analytical work.* Even "proper names" subserve a similar purpose. A child in learning to name his nurse, "Nana," is giving definiteness and fixity to his mental representation of the group of permanent and distinguishing characteristics which constitutes this individual so far as she is known to him.

This use of names already begins to appear in children's first imperfect employment of them. There are two ways in which a child may come to the use of language. (*a*) He may hear a name employed by others, and, by noting the recurring similarities in the objects to which this name is successively applied, may gradually come to *understand* its meaning. Here the verbal sign which is to be associated with, and so to recall, the general idea is directly presented along with the objects, and by recurring only with such objects as have certain similar features it comes to mark off the results of the child's assimilative activity. Thus in learning such a familiar name as "milk" the application of one and the same name to a series of partially dissimilar objects helps materially to further assimilation and the formation of a generic image. When later on he comes to the use of speech he learns by help of the imitative impulse

to reproduce the name when he sees another similar object, or mentally represents one. There is probably a rudiment of true thought-activity, of comparison and analysis, in this early mastery of others' words. Yet we are justified in saying that it does not imply a clear grasp of generalities. At the same time, the learning of the name does materially further that process of assimilation on which the development of generic images depends.

(*b*) A child does not, however, merely learn the use of words from others; he spontaneously invents verbal signs, and extends the use of those supplied him by others. Thus children in the second and third year have been observed again and again to invent a common sign for eating and eatable things. Again, children a little older, after they have learnt our names, are wont to apply them in a new and original manner, as when the names "key" and "star" were extended to all bright objects.[1] Here, it is evident, assimilation precedes the naming: the child recognises the familiar feature of brightness in the new object, and greets its reappearance, so to speak, with the recognition-sign. Yet in this case, too, the impulse to name objects so far as they can be assimilated greatly helps to fix in the child's mind a definite representation of the particular feature or features concerned. Here also the use of common names serves to hold together in a compact and well-defined form the successive results of assimilation.

Formation of More Abstract Notions. The formation of the general ideas considered so far, for instance,

[1] For a full account of children's invention and original application of names, see my *Studies of Childhood*, pp. 145 f., and 162 f.

"cat," "bright," involves, as we have seen, but little thought-activity. The general idea may be said to form itself, so to speak, by help of comparatively simple and mechanical processes of assimilation, aided by the differentiating and defining or limit-setting use of a name. This comparatively passive process may be carried out in all cases *where similarity in its extent and its impressiveness preponderates over dissimilarity.* To extend a name first applied to a star to a candle or gas flame is simply to use it as a recognition-sign of all that was prominent and interesting in the presentation of the star, *viz.*, its brightness. It is much the same when the sign "bow-wow" is applied to new specimens of the class "dog"; though here some interesting differences, such as those of size and colour, accompany and may disguise for a moment the common features.

It is otherwise when a child is called on to carry the process of abstraction to a further stage, and separate out points of similarity running through a larger variety of objects, and much more hidden by surrounding differences. Thus in order to find out what is common in the form and actions of dogs, horses, mice and so forth, so as to reach an idea of *animal*, the child needs to *think* in the complete sense, to recall and compare many presentations, and by a strenuous effort of concentration to fix his mind on the common features. Such an idea as that of "animal," by representing subtle and not easily recognised points of similarity running through a wide range of very unlike objects, may be called a general idea of a highly abstract character. It shows in a specially clear form the *concept* in its differentiation from the generic *image*.

A special effort of abstraction is involved, further, in the singling out for special consideration of *single qualities* in objects, as when a child begins to call his ball or his hoop round, and to use what logicians call "abstract names," *e.g.*, roundness. The use of this more abstract language follows that of the more concrete. Children have but few adjectives in their first vocabularies, and these are probably used as the equivalent of concrete names; and abstract names, such as "roundness," appear much later still. When they begin to be used we have evidence that the process of analysing complex percepts is carried to a still higher point, *viz.*, to the distinguishing of single qualities, such as redness or heaviness, which may be possessed by objects quite dissimilar in other respects. It is by this finer, more detailed analysis of qualities that our conceptual knowledge becomes perfectly definite. Thus it is only when a child can separately think out the several qualities of water, *e.g.*, that it yields to the hand, that its parts do not hold together, etc., that his knowledge of this substance acquires a perfectly precise form. Such detailed analysis leads to a new *explicit synthesis of qualities*: the water now becomes that which has this, that and the other quality, which together compose the characteristic group of qualities.

Variety of Concepts. It follows from what has been said that the general ideas of material things and their qualities present a great variety. A material object, say a chair, can be referred to a great many distinct classes, as, for instance, a piece of furniture, a wooden thing, and something made by manual labour. These concepts will, it is evident, differ in the degree of their abstraction.

In addition to these general ideas of things, there are ideas of *changes* in objects, also of their *movements*, including the *actions* of living things, such as are expressed by the names "expanding," "melting," "rolling," "jumping," "flying". Here, again, we may distinguish between concepts of a higher and a lower level of abstraction. Thus the idea of action in general is much more abstract than the idea of walking or talking.[1]

With these concepts must be taken those of *relations*, such as those of *space, e.g.*, to the right, to the left, within, without; of *time, e.g.*, before, after, a week ago; *cause and effect*, such as making a noise or lighting a fire. These ideas of relations are among the last to attain to precision. This is shown in the late use by children of relational words and word-changes, *viz.*, the tense-forms of verbs, adverbs of time and place, and prepositions.

THE CONCEPT AS A SYNTHESIS OF ATTRIBUTES: MATHEMATICAL IDEAS. So far, we have been viewing the concept as the result of analysing out qualities and relations from presented groups. But we cannot understand the way in which thought-activity proceeds without referring to another side of the process, *viz.*, the synthetic combination of these qualities and relations.

To begin with, then, we must remember that children learn the qualities of things gradually. They know milk as the white-sweet thing before they know it as a fluid, and they know it as fluid long before they know anything of its chemical composition. *As new observa-*

[1] Mr. Stout has shown that in the languages of certain savage races we have a name for doing something by pressing with the foot, but no name for doing a thing in general. *Analytic Psychology*, ii., p. 230 ff.

tion and study discover new qualities in things, these are synthetically incorporated into the concept. Many of the new elements thus taken up into the concept are acquired from the observations and reasonings of others. To a child a star is nothing but a twinkling point of light far away: by-and-by he learns that this point of light is a big, big planet. His later "concept" of a star is almost entirely built up of what others tell him about the object.

There is another way, too, in which a synthetic bringing together of attributes enters into the process of conception, *viz.*, *whenever we are called on to form new general ideas by a constructive rearrangement of old ideas.* This is illustrated in many school studies, such as history, in which the learner has to build up out of the results of his own previous observations and generalisations such ideas as "king," "invasion," "law," and so forth.

This process of conceptual synthesis is carried out in close dependence on an act of constructive imagination. By this last the mind of the learner fashions an image, say, of King Alfred, or of the landing of the Romans in England, and it is the image so formed which supplies the basis of the concept.

In a certain class of cases this preparatory work of imagination is wanting: the concept transcends the limits of distinct visual representation. This process is illustrated in the formation of ideas of objects of great magnitude, also of large quantities, such as a city, the earth, the diameter of the earth, the number 1000. A child's first ideas of quantity, say, the length of a yard, or the number 5, are based on sense-perception. A yard *looks*

different from a foot, and five things look different from four things. Even in the case of small quantities, however, a process of analysis and of synthesis takes place. Thus by superposition the yard is broken up into 3 feet, and reconstructed by adding foot to foot. So with numbers : 5 is only understood when it is resolved into so many units, and reconstructed by adding unit to unit. In the case of the greater quantities, as a mile or the number 1000, the process of synthetic addition or summation lies at the basis of the whole idea. The number 1000 does not correspond to any distinct percept or image. It merely represents the result of an extended process of summing or counting performed on units or small groups of units, which are themselves sensible objects, and so picturable. This prolonged process is not of course fully carried out, but its extent is suggested or hinted at by the symbols employed ; *e.g.*, 1000 is succinctly represented as the product of $10 \times 10 \times 10$. In like manner the ideas of very small quantities, as $\frac{1}{1000}$th part of an inch, represent the result of a symbolically abbreviated process; only that here the process is one of division, and so of analysis.

This synthetic activity is illustrated in a somewhat different way in the formation of the notions of geometry. Our idea of a mathematical line or of a circle does not exactly answer to any observable concrete form. The lines we draw even with delicate instruments, not to speak of the lines drawn with chalk on the blackboard, have some thickness, and so are not perfect mathematical lines ; and they are far, too, from being perfectly straight in the mathematical sense. It follows that such geometric ideas are not reached merely by an analysis of percepts.

They imply an additional process, *viz.*, *idealisation.* The student of geometry, in thinking about a perfectly straight line, has to frame an ideal conception which not only goes beyond what the mind can pictorially represent, but even beyond what is discoverable in any actual forms. Hence the peculiar difficulty which many a beginner in the science experiences in attaching any reality and meaning to these forms; and hence, too, the peculiar and half-poetic charm of the science to many.

The concepts used in physics, *e.g.*, "perfect fluid," "perfectly rigid body," have something of the same ideal character. The distinction between concepts answering to pictures, and those which cannot be reduced to images, is related to the distinction drawn by certain logicians between Symbolic and Intuitive knowledge. We have an intuitive knowledge of the number 3 and of the figure triangle because we can picture them, but have only a symbolic knowledge of the number 1000 or of the figure chiliagon (one of a thousand sides) (see Jevons, *Elementary Lessons in Logic*, vii.).

Moral Ideas:[1] Idea of Self. By a process of thought essentially similar to that whereby he learns to group external objects according to their resemblances, a child comes to a knowledge of the inner and moral world, that of his own mind and character. His idea of self begins with the perception of his own organism. This object, which, as we have seen, is known, like other objects, to the senses of Touch and Sight, is differentiated from all others by its immediate connection with the

[1] The expression "moral idea" is used as the most convenient one for marking off our knowledge of the "inner" region of mental phenomena from ideas of material or external objects.

child's sensations and their varying feeling-tones on one side, and his active impulses on the other side. It is when his body is hurt by a fall, or caressed by the mother's hand, that he experiences pain and pleasure, and he soon comes to localise his sensations more or less definitely in some region of his body. This idea of self as material, as body, is probably the prominent one during the first three years of life, the period during which the child speaks of himself, as of any other object, by means of a proper name.[1]

This focussing of attention on the bodily self shows that the child is unable at first to *reflect*, *i.e.*, turn his attention inwards on his mental states. He is glad or sorrowful, he wants to do something, but the feeling, the desire, does not become a definite object of reflective thought. His attention is absorbed in the presentations of sense, the changing appearances of the objects of the external world. To attend to the changes of the inner life implies an effort, a kind of abstraction or withdrawal of the mind from the more impressive changes of the outer world. This only occurs later on, when the will-power which sustains all the activity of thought is developed. The first steady directions of thought to this inner or spiritual self appear to be prompted by the growth of certain feelings, such as the love of others' approbation, pride in displaying one's prowess, shame, etc.

The influence of others' words and behaviour is an important factor in the growth of this fuller idea of self.

[1] For a fuller account of the idea of the bodily self, see Preyer, *The Development of the Intellect*, chap. xix., and my *Studies of Childhood*, p. 109 ff.

Our idea of our intellectual and moral self, of what we are *worth*, is largely a reflection of others' thought about us. This has been called our "social self" or the "social me".[1] In the case of the child this influence of others' opinion in directing thought to the self, and moulding its form, is at work throughout the whole process of education. It is the constant appreciation of his thoughts, feelings and actions by the mother, as when she says, "That's silly," "That is an ugly face," "This is nicely done," and so forth, which acts most powerfully on the early growth of self-consciousness. Yet the gradual substitution for the proper name of "me," "I," "my," etc., which is observable towards the end of the third year, appears to mark the date of the child's clearer reflection on his thoughts, feelings and efforts.

While the first form of moral self-consciousness thus reflects others' opinions and feelings, a further process of reflective analysis is implied when a child's memory develops, and he begins to "go back" to his past experiences, and to realise his *continued existence* as one and the same self. Here it is evident we have to do with a kind of generalising process, the discovery of common elements running through a series of very unlike experiences. The image of the ever-persistent body with its characteristic features, which always comes up in such comparisons of the present and the past, still contributes an important basis to the idea of self. But other elements, persistent modes of thinking about things, of feeling and of behaving, now begin to enrich the idea. The child is beginning to realise what philosophers call his *personal identity*.

[1] See W. James, *Psychology*, p. 179.

This new idea of a permanent self is highly abstract and is difficult for a child. It is rendered still more difficult by the fact that the years bring great changes both in bodily appearance and in modes of thought, tastes, etc. A boy of eight seeing a photograph of himself at the age of three is apt to regard it as representing another child, and the comparison of the later ideas and activities with those of the nursery makes the recognition of personal identity yet harder. Thus a good deal of hard thinking underlies the apprehension of *the unity of the self in spite of all the change.*[1]

The highest result of this reflection is the idea of a distinct individual or personality with a well-defined group of intellectual and moral capabilities. This idea, as we have seen, begins by the adoption of others' estimates. It only grows clear, however, by processes of self-examination. Such self-inspection is essentially a generalising process, a comparison of many particular thoughts, feelings and actions, and a detection of the general qualities which these disclose. This independent realisation of one's own mind and character is often favoured by want of others' appreciation. A child may wake up to a consciousness of his powers, and to an estimate of his character, under the stinging stimulus of others' disparagement or indifference.

Ideas of Others. In close connection with this development of self-knowledge there grows up the knowledge of others as having feelings, thoughts, desires, as we have. There are many facts which point to the pres-

[1] *Cf.* my *Studies of Childhood*, p. 116. On the doubling of "self" by children, as in projecting an *alter ego* into the echo of one's voice, see the same volume, p. 496.

ence in the child of an instinctive impulse to vivify or give life to things generally, and to endow with feeling any object which resembles himself, more particularly in appearing to be able to move itself. Thus children have been known to regard feathers, falling leaves and railway engines as alive and endowed with feeling.[1] Later on, this impulse of personification is checked by the growth of knowledge and discriminative power. The child learns now to distinguish between inanimate and animate objects, and between the several grades of the latter. It is at this stage that he attains to a clearer awareness of the essential similarity between his own mind and those of other human beings.

The knowledge of self and of others react one on the other. A child is only able to think of another person, *e.g.*, his mother or brother, as a conscious being, by reflecting on to the object something of his own inner experience. On the other hand, the observation and understanding of others materially aid in the development of a fuller and more accurate knowledge of self, and this in a double way: partly, as we have seen, because others' thought about us helps to determine our thought about ourselves; and partly because by entering into others' ideas and feelings we enlarge our experience, and so gain a deeper knowledge of our capabilities.

It is to be noted that in this thought about ourselves and others there is not only analysis and generalisation, but synthesis or constructive rearrangement of ideas. This applies to the understanding of others. When we are making a study of a stranger we form a preliminary idea of his mind and character by help of our previous

[1] See my *Studies of Childhood*, pp. 30 f. and 96 f.

observations. A higher kind of synthetic activity is involved in the formation of *ideal conceptions* of ourselves and others. To idealise a person is to take the idea of what we regard as the most fundamental and valuable elements of his character, and to conceive of these as attaining to a fuller and more perfect realisation. In all moral aspiration the construction of the representation of a "higher" or "ideal" self forms an essential element.

Relation of Conception to Imagination. The above account of the process of conception enables us to see yet more clearly how the general idea or (as it becomes in its perfect form) the "concept" is related to the mental image. Thought—that is to say, "conceptual thought"—is commonly opposed to imagination, and we have now to see how far this opposition holds good.

That to imagine is not the same thing as to think about generalities is at once evident. To imagine is to represent a concrete object in something approaching to its fulness of detail: to think is to inhibit this tendency to "picture out" the objects represented, to restrict attention to certain selected aspects of the objects. Hence a strong vivid imagination in a child is apt to hinder clear conceptual thought. This is illustrated in the suggestive action of words on an imaginative child. Such an one instantly begins to reduce the verbal symbols to images of certain individual examples. Talk about "tree," "house," a "sheet of water," to such a child and he will "picture out" more or less fully some familiar specimen.[1] Hence the difficulty well known to observant teachers in presenting abstract subjects to children of quick and lively fancy. And in the case of the more difficult mathematical concepts just referred to it is evident that since conception transcends the limits of imagination the two processes are in a manner opposed.

Yet here, too, to speak of an opposition merely is to do injustice to the real state of things. As we have seen, our general ideas are formed

[1] This holds good, too, of imperfectly educated adults. The tendency is amusingly illustrated by Mr. Galton. Some one began narrating: "I am going to tell you about a boat". A young lady of an imaginative turn being asked what the word "boat" called up, answered: "A rather large boat, pushing off from the shore, full of ladies and gentlemen" (*Inquiries into Human Faculty*, p. 110).

out of images. If a child could not pictorially represent a dog, a tree, or a river, he could not think of these objects under their general aspects. And while conception thus depends on the presence of memory-images, it depends also, as we have just seen, on the formation of new pictorial representations by the process of productive imagination. The clearness and fulness of the pictorial images is indeed one great condition of the attainment of clear and exact general ideas. It is only, for example, when a child can readily recall the whole look and feel of a piece of clay, or of one of the metals, that he can go on to think in an abstract way about its several qualities, so as to reach the general notion of "clay" or "metal". As we shall see presently, the products of thought-activity, the concepts which our minds form and embody in words, require, in order to remain clear representations of what really exists, to be referred back to concrete examples; and this keeping of the concept in living touch with real things is greatly aided by a ready imagination.

CHAPTER XIII.

THOUGHT-ACTIVITY: (A) CONCEPTION (CONTINUED).

EARLY DEVELOPMENTS OF CONCEPTION.

Beginnings of Abstraction and Comparison. It is often said that a child "abstracts" before he comes to the use of words. This, however, is doubtful. The fact that children in perceiving objects fasten their attention on certain salient and interesting marks shows, no doubt, that they carry out a process analogous to abstraction (compare above, p. 198). But animals appear to do the same thing, and yet we hardly attribute to them a power of abstraction.[1]

True abstraction, that is, the clear apprehension of a quality *as such*, comes only after some use in language. This is seen in the late use of adjectives, which will be spoken of presently. Such a clear mental grasp of a quality, even so simple and conspicuous a quality as bigness, seems to be reached only after a certain measure of comparison.

Thought-activity begins in normal cases to manifest itself in a very rudimentary form as comparison early in the second year. An infant of ten months that selects a

[1] Perez seems to me not to distinguish carefully enough the first scrappy perception from abstraction proper, *i.e.*, a reflective analysis of presentations (*The First Three Years of Childhood*, p. 179 ff.).

piece of cake when placed in juxtaposition with a piece of bread does not necessarily carry out a comparison and an explicit apprehension of differences. But early in the second year clearer cases of comparison occur. Thus a child will look from his nurse's face to the reflection of the same in a glass. He will also about the same time show that he is beginning to understand pictorial representations of objects.

Clearer evidence of comparison appears later when words are used. Thus a child, when recognising a plate as dirty, will say, "This is a dirty plate, not a clean plate"; and this form of speech shows that he is beginning to grasp the relation of contrast.[1]

Soon after coming to the use of words, that is, in favourable cases, early in the second year, a child will further give evidence of carrying out very rough and imperfect processes of *classing objects*.[2] This aspect of the development of children's intelligence must now be discussed more fully.

FIRST RUDIMENTS OF THE GENERAL IDEA. The early stage in the formation of general ideas is one of the most interesting phases of the child-mind, and is one, moreover, which has received considerable attention from workers in the field of child-psychology. By a careful observation of children at the time when they begin to understand and use words, we may learn much as to the way in which this power spontaneously develops. More

[1] See my *Studies of Childhood*, pp. 174, 175.

[2] The beginning of generalisation before the use of words is discussed by Preyer, *The Senses and the Intellect*, chap. xvi., "Development of the child's intellect independently of language". It may be doubted, however, whether the processes he describes amount to true conception.

particularly, it is instructive to watch the way in which children in the second and following years invent names of their own, and spontaneously extend those which they learn from others to new and analogical cases.

As already pointed out, the first use of language by the child does not imply that at this early stage he is forming clear *general* ideas, or ideas of classes: it simply points to the strong working of the assimilative or apperceptive impulse. This applies to the use in the second year of what may be called "appetite-signs," *e.g.*, "mum," which was used by Mr. Darwin's boy at the age of one year for various edibles. Such signs certainly do not mean that a child has a clear general notion of a *class of things* (foods). It applies, too, to the extension of names, like "star" or "lamp," to bright things generally (compare above, p. 317). This assimilative extension of names is common to the child and the savage. Thus a Bakairi Indian when first shown a mirror displayed no surprise, but nodded and said quietly, "Water".

The first general ideas formed correspond, as might be expected, to narrow or "concrete" classes, having a number of striking points of resemblance. This may easily be seen by studying the vocabulary of a child of four. He uses the names milk, water, tea, etc., but has no name for something to drink in general. In like manner he uses the name "house," but not "building," "apple," but not "fruit," "doll," "gee-gee," but not "toy". Herein his language resembles that of savages.

In saying that the general names first used by children are of concrete classes, it is not meant that they proceed regularly from lower classes ("species") to higher classes ("genera"). As we all know, a child will use the name

"tree" long before he uses the names "oak," "elm," and the rest. At first the assimilative function seems to push on in advance of the discriminative function. It is often said that the child is impressed more by similarity than by dissimilarity; and, though the statement in this general form is somewhat inaccurate, it expresses the truth that the young mind will form a class of like things—when the likeness is patent and impressive—before it distinguishes the several varieties or sub-classes included in this class.

The first class-ideas are determined by *special interest.* Thus a child learns the use of "milk," and of "dolly," because he is specially interested in these things. Æsthetic interest, too, plays a considerable part in the selection of the first general ideas, as is seen in the acquisition of such names as "flower" and "picture".

Little by little, however, the child does enter on a true process of generalisation. Thus the names for the several kinds of familiar food, such as milk and pudding, soon begin to have a general import. A child notes that the things which he and others eat or drink disappear, wholly or in part; and he readily reaches the distinction between, say, one and the same pudding on the table to-day and yesterday, and a new pudding. When this awareness of individual distinction arises, he proceeds to frame general notions or class-ideas, in the full sense of the word. Thus "pudding," "puss," "mamma," "baby," and a host of words come to be used intelligently within the first three or four years as *general* signs. The instruction of the nursery greatly aids the child's thought-process here.

Some of this early generalisation follows not our distinctions as fixed in the common language, but lines of

childish thought. This is seen in some of the extensions of names by children to analogous presentations, as when the crackling noise of the fire was called "barking," and the barking of a dog "coughing". In these cases genuine movements of thought in the direction of class-ideas may transcend the generalisations fixed in our conventional speech. The same applies to original inventions such as "dig" for a hole dug in the ground, "rainer" for a person who sends rain.

Differentiation of Language-Signs. At first a child uses words neither as substantives, as verbs, nor as adjectives. His verbal signs, like his ideas, are "general" in the sense of being undifferentiated. Thus "doll" may mean, "Where is dolly?" "Dolly has fallen," and so forth. Little by little the child distinguishes the functions of words, and comes to use the names of things and actions as such. A noteworthy event in this linguistic progress is the first use of adjectives. A child of two may pick up and use a few adjectives, such as "hot" and "nice," which answer to simple sensations of very great interest to him; yet these are probably used as names, *e.g.*, "nice thing". A more difficult achievement is seizing the meaning of a relative term such as "big". The boy already referred to first employed this word when he was about twenty-two months old. Seeing a rook flying over his head, he called out, "Big bird". It is worth noting that children frequently use what we call a substantive for qualifying a thing, as in the common practice of calling a small object "baby" this or that (*e.g.*, in applying the expression "baby ship" to a boat by the side of a large ship).

Among the more abstract conceptions reached in the

first years of life, those of number and time deserve a passing notice. Professor Preyer says that his boy in his twenty-sixth month had not the remotest idea of number. Another boy, already referred to, when twenty-two months old, distinguished one object from a *plurality of objects*, and this some time before he could distinguish two from three, and so on. He called any number of objects (except one) "two, three, four," according to the formula taught him by his mother. When three and a half years old, the same child still confused number with size.

This answers to the fact that many savage races cannot count above five, *i.e.*, beyond the point at which differences of number are plainly apparent to the eye. The lower animals seem to have only the most rudimentary perception of numbers. M. Perez (*The First Three Years of Childhood*, p. 185, etc.) tells us that this corresponds to an animal's distinction of number. A cat when only one kitten out of a number was left it was miserable; but when two out of five were left it was contented. It thus distinguished between one and many. Sir John Lubbock lately remarked that if four eggs are in a nest, one may be taken without troubling the mother; but if two are removed, she commonly deserts the nest.[1]

In like manner, it is common for children to mark off all periods of the past under the head of "yesterday," and all periods of the future under the head of "to-morrow" or "by-and-by". A considerable improvement of thought-activity is necessary before they can pass from this rough discrimination of one and many to the discernment of particular numbers, and from a mere discrimination between past and future to the discernment

[1] On the early development of concepts of number, see Perez, *The First Three Years of Childhood*, p. 185 ff., also an article by Professor Dewy in the American *Psychological Review*, 1896, p. 328 ff.

of definite divisions of time, as yesterday, to-morrow, last week, next week.[1]

From about the twelfth year on we notice in the case of children undergoing instruction a marked progress in the use of "abstract language". They begin to assimilate and make use of the abstractions which enter into the language of their cultivated elders. Thus they talk of "heat," "strength," "shape," and even of such subtle abstractions as "the future," "belief," "fairness," and so forth. It is to be noted, however, that such abstract language remains for a considerable time highly pictorial in its import: the abstract thought is not yet clearly detached from a mental image. This has been ascertained by questioning young persons between the ages of thirteen and eighteen as to what thoughts or images such terms as "number," "coldness," "infinite," first bring into their minds. "Coldness" suggested to one child "a frosty ground, with here and there a stump," to another, "dressing myself in a big overcoat," "abstraction" to one child "a man with head resting on hands, elbows resting on marble-topped table".[2]

Varieties of Conceptual Development. Children as well as adults differ considerably in their ability to generalise and in the wealth and variety of their general ideas. Some minds are quicker than others in detecting similarity amid diversity, and in bringing to light the common aspects of things. These differences turn partly on inequalities in power of mental concentration; for, as

[1] The student will find a much fuller account of children's early thought-activity in my *Studies of Childhood*, chaps. iii., iv. and v.

[2] Sara E. Wilke, *The Place of the Story in Early Education* (Boston, 1892), p. 116 ff. Compare what was said above, p. 328 f.

we have seen, to compare and analyse things involves a special effort of attention. They depend too, in part, on inequalities in the power of apprehending similarity. There is reason to believe that certain persons have a special interest in the similarities of things, and a special readiness in apprehending these, whereas others have a relatively greater interest in, and aptitude for, the *differences* of things.

To analyse and generalise is one and the same process whatever the particular nature of the subject-matter. Yet special directions of interest and observation produce corresponding differences in the lines of conception followed out. Even a child of four may be seen to develop his general notions along special lines of interest, as when his mind becomes absorbed in animal-lore, machine-lore, and so forth. Special tastes and lines of observation and reflection will lead one boy to develop more readily natural history concepts, another, concepts of number.

While, however, natural tastes thus serve to fix the lines of conceptual development, the height reached in generalisation is largely determined by the kind and amount of training undergone. It is obvious, indeed, that a well-educated youth is distinguished from a badly educated one by the possession of a good stock of clear general notions and a readiness to note and mentally detach the common aspects of things. It is no less manifest that devotion to any particular branch of science, *e.g.*, geometry, will develop a special facility in forming and making use of the concepts of this science.

Measurement of Conception. As we pass to the higher and more complex intellectual processes, perfectly satisfactory modes of measurement seem to become more difficult. Simpler thought-processes, and

especially comparison, may be tested by the methods already referred to. Thus when pairs of lines are successively presented to the eyes of children, and they are asked to say which is the longer, the percentage of errors made may be taken as testing the power of comparison and grasp of *the relation of difference* in this particular domain of visual phenomena. It is more difficult to test the process of forming clear concepts. We must remember that the mere ability to repeat a definition of a name is no test of conception. A better test would be *quickness in recognising examples of the class*, or concrete manifestations of the quality. Such exercises might be graded, passing from fairly easy cases, where the presence of the common quality or qualities is apparent, to difficult and *extreme cases*, where the presence of the common quality or qualities is veiled. In this way, for example, it would be possible to test the clearness of a boy's concept of a natural form, such as oak-tree, of a geometrical form, for example, triangle, and of a substantive, or other verbal class. This might be supplemented by the reverse process of asking children to write down as quickly as possible the higher class or "genus" under which they would place certain smaller classes or "species," such as "oak," "sugar," "gimlet," "the colour purple".

REGULATION OF CONCEPTION.

LOGICAL DEFINITION OF CONCEPT. So far, we have dealt with the psychological side of conception, that is to say, with the process of generalisation and its developments. We may now pass to the logical side of the subject. This is a matter of so much importance to the teacher in training a child's mind in abstraction that a somewhat full reference is necessary.

In its proper logical sense a "concept" is a clearly thought out general idea, so that all that is implied in it is explicitly apprehended and formally set forth in words. It signifies further that this mental representation of the individual is accurately adjusted to the commonly recognised meaning of the term among competent and educated people. In other words a concept is an *ideal*,

a perfected form of our actual ideas. In order to have a true "concept" of a metal, I must have a clearly analysed idea, so as to apprehend the several constituent properties which compose or constitute a metal according to the proper and generally accepted definition.

Logicians tell us that the accurate adjustment of an individual's general ideas to the conceptual standard includes two things. In the first place, as the result of his mental analysis, he must represent the precise group of qualities which are "essential," or, in other words, which are specifically marked off as the *connotation* of the term. Thus I think the concept "metal" with logical correctness when I distinctly represent those common and fundamental attributes, such as being an element, a good conductor of heat, and so forth, which scientific men agree should form the meaning or "connotation" of the word. In the second place, and as a consequence of this adjustment, the name must be applied to exactly those objects, no less and no more, to which it is strictly applicable. In other words, the name must be used with the right *denotation*, as well as with the right connotation. Thus "metal" must be applied to liquid mercury as well as to the solid iron, and it must not be applied to things which are not, properly speaking, metals, such as stones.[1]

IMPERFECTION OF CONCEPTS: (*a*) WANT OF DISTINCTNESS. Now, the general ideas of children, and indeed of most adults, are far from having this logical perfection. To begin with, they are apt to be *indistinct*, wanting in a precise apprehension of the several qualities and rela-

[1] On the meaning of denotation and connotation (called also extension and intension), see Jevons, *Elementary Lessons in Logic*, lesson v.

tions implied. As we have seen, children's general ideas begin by being pictorial images ("generic images"), which, like the first form of the percept, are apprehensions of *wholes*, in which the constituent parts, qualities, and relations are not distinctly separated out one from the other. In this way a child of four or six uses the names "dog," "house," "flower," and the rest. The idea serves in general for recognising members of the class when they present themselves: a child knows a dog, a flower, when he meets with one—in most cases at least. But he is unable to answer the question, "What is a dog?" or "What is a flower?" so as to give an intelligible and precise account of the object. Thus he may be able to get as far as to say, "A flower is a pretty thing growing on a bush": but he has no idea of the parts of a flower and of their arrangements as a botanist has.[1]

In the case of children a further and prolific source of indistinctness or vagueness is *partial comprehension of the meaning of words as used by others.* The fact that a child is daily hearing a highly developed language, in which the finer distinctions and the more subtle generalisations of the mature intelligence are embodied, leads to a good deal of vague apprehension of meanings. A child will often be puzzled to know what exactly is meant by such words as "upright," "righteous," "honourable," and so forth. Even some persons who habitually use these words might find it hard to explain their meaning.

[1] According to Leibnitz, a notion which enables us to recognise an object, and to keep it clear from other objects, may be called "clear," though it is not "distinct," in the sense explained in the text. See Jevons, *Elementary Lessons in Logic*, lesson vii.

This tendency to acquire vague, partial apprehensions is aided by the ambiguities of language, as when we call both a fruit, and a boy who behaves nicely, "good". But I shall return to this presently.

Even when the process of analysis described above has been carried out, and the idea has been developed into a conceptual form, it may *become* indistinct. This arises from the peculiar structure of the concept. As we have seen, this is a general idea, in which attention is kept focussed, so to say, on certain special features of the object represented by help of the name. Thus when a child distinctly thinks out what we mean by a "metal," he concentrates attention on the fundamental qualities. But if he loses his mental hold on these, and if the word "metal" now calls up in his mind only an unanalysed image of a particular metal, say iron, his concept will have fallen back into its original indistinctness. The same of course applies to the concepts reached wholly by way of instruction, such as "watershed," "rectangle," "transitive verb," and so forth. They begin to grow hazy as soon as the essential and determining qualities slip away from the mental grasp.

Although the logician distinguishes the connotation and the denotation of a general name, that is to say, its meaning and its application, it is easy to see that they are closely connected. As has been conceded above, a child may be able up to a certain point to recognise an object and apply the corresponding name correctly without having a distinct apprehension of the several determining qualities. Yet in difficult cases, where an object lies, so to say, on the margin of the class, only a distinct grasp of the qualities which make a thing a house, a

flower, or what not, will suffice for identification. Thus a child who had no distinct idea of the essential qualities of a house would not be sure whether a barn was to be called one. We may say then that *it is only analysis and the distinct unfolding or separating out of the constituent parts of a general idea which will enable us to apply it accurately in all cases.* Distinctness of conception may thus be tested by the form of question, "Is this a house?" (or a rectangle, and so forth), as well as by the form, "What is a house?" (or a rectangle, and so forth).

(*b*) WANT OF ACCURACY. From the mere indistinctness of a concept we have to distinguish its positive *inaccuracy.* The distinctness of a concept depends on our representing the several characteristic qualities: its accuracy depends on our taking up *the right elements, i.e.,* the common and essential characters of the class as recognised by others, no more and no less. Thus a correct notion of "rectangle" should definitely include the presence of four right angles, and should *not* include equality of the four sides.

It follows from what has been said about the relation of the meaning of a name to its application (connotation to denotation) that *inaccuracy of meaning leads to inaccuracy of application.* Thus a child who thought that a metal is always and necessarily a solid body would err by not recognising mercury (quicksilver) as a metal.

Inaccuracy of conception, like mere indistinctness, may arise either through an imperfect carrying out of the processes of comparison and analysis or through a subsequent process of decay or disintegration of the concept.

To begin with, then, the first general ideas of all of us are apt to be more or less inexact because of the rough

character and limited range of our inspection of the objects. Owing to these causes our generalisation becomes inaccurate; and this in one of two ways, by way of comprehending either too much in the meaning, or too little. It is a logical commonplace that when you add to the meaning of a term, you tend to restrict its application; and that when you subtract from its meaning you tend to widen its application. Consequently we may call concepts which comprehend too much in their meaning too *narrow*, as answering in their application to too few objects. Similarly, concepts which comprehend too little in their meaning may be called too *wide*, as answering in their application to too many objects.

Narrowness of generalisation is very common, and grows out of *insufficient range of observation.* For example, a child who has only seen red roses is apt to regard what we call the accidental quality of redness as a part of the meaning of "rose"; and one whose acquaintance with metals covers only the more familiar examples, such as iron, would naturally comprehend hardness and solidity in his idea of the class, which would thus *exclude* quicksilver. We are all, indeed, apt thus to take up into our general notions the accidental associations of our individual experience. Thus to many Englishmen, even in these days of universal education, "religious" means possessing one particular form of faith.

Excessive width of application comes, not from an insufficient range and variety of observation, but from *imperfect examination of what is before us.* If our observation is superficial and hasty we shall detect and mark off only a part of the common traits or characteristics, *viz.*, those which are especially prominent

and impressive. The notions of children and of the uneducated are apt from this cause to be too wide. They pick up a part, but only a part, of the significance of the words they hear employed. For instance, they observe among different creatures called "fish" the conspicuous circumstance that they live in water; and, knowing nothing of the differences of structure and habits of life between a fish and a mammal, they tend to make this circumstance *the whole meaning of the word.* Consequently they are ready to call a porpoise, a seal, or any other animal living in water, a "fish". In a similar way a child will call a bat a "bird".

Our concepts tend still further to become inaccurate, just as they become indistinct, by the lapse of time and the gradual dropping out of some of their elements. Thus, for example, children, and indeed all of us, are apt to forget that a perfectly good or virtuous action is more than an action which is externally good, that it is an action which springs out of a good disposition. Every successive loss of such elements involves a growing divergence between the name and the things denoted. The converse error, too, of allowing accidental accompaniments to insinuate themselves into, and blend with, the concept, is not uncommon. You might begin by defining "emperor" to a boy, but if afterwards you were to allow him to read only of Alexander, Napoleon, and other military emperors, he would pretty certainly import the idea of generalship and conquest into his concept.[1]

[1] Waitz instances the tendency of a boy, even after the definition of an angle has been given him, to fall back into an erroneous first conception that the *length of the sides* helps to determine its size. *Allgem. Pädagogik*, § 21.

It may be well to add that the two imperfections of concepts thus distinguished, indistinctness and inaccuracy, are closely related. When our ideas of things are hazy, and there is no clear grasp of the determining qualities, there is a peculiar danger of dropping essential elements altogether, and, further, of taking up extraneous and accidental ones.

CONCEPTION AND DISCRIMINATION. So far we have regarded the concept merely as a single separate product brought about by analysis and the selection of like or common features. But thinking is always a double process of differentiation and integration. We mark off or discriminate in the very process of generalising. In forming a clear concept of "animal," for example, we are not only connecting many unlike things on the ground of their resemblances (animal structure and functions), but have, in the margin of our consciousness at least, an idea of the *difference* between the animal and other things which lack these resemblances (plants and lifeless objects). When we think of the class European we are by implication marking Europeans off from non-Europeans (Asiatics, etc.). *To constitute a class by the presence of certain marks is virtually to distinguish it from other things wanting these marks.* In all cases where there are well-marked contraries or opposites, *e.g.*, heavy—light, sweet—bitter, good—bad, and so on, this process of discrimination of class from class becomes more explicit. To bring an object under the class of light bodies is to set it in opposition to the class of heavy ones.

It follows that in order to have clear concepts, and to think clearly about things, we must become explicitly aware of their differences. The difference between "man" and

"brute," which is an element of our "*marginal* consciousness" when we are thinking about "man," requires to be made "*focal*" if we would know clearly what man is and is not. This full conscious comparison and discrimination becomes especially important in the case of all concepts which from their similarity are apt to be confused, especially by children; such as "strong" and "healthy," "sensible" and "clever".[1]

SYSTEMS OF CONCEPTS: CLASSIFICATION. The differences among concepts are fully dealt with by logic. One of the most important of these is that between the General and the Singular concept or name, as illustrated in "man" and "this man". This distinction has been touched upon above. Another is the distinction between *positive* and *negative* names; such as "elastic" and "inelastic". Here the fundamental process of thought-differentiation is distinctly recognised and formulated. These logical distinctions among concepts deserve the careful study of the teacher.

Logic attempts further an orderly systematic review of the agreements and the differences among things in what is known as *logical classification*.[2] To classify things is to view them in such a way that the several degrees of resemblance and difference between them may be clearly exhibited. This may take place by proceeding

[1] To use the language of Leibnitz, such imperfectly differentiated concepts would be "obscure" or wanting in "clearness". See Jevons, *Elementary Lessons in Logic*, lesson vii.

[2] The student should carefully distinguish this meaning of "classify" from the looser meaning of the term, as when we say that we "class" or "classify" an object by taking it up into a concept. Classification, in its proper and complete sense, means *methodical arrangement of classes*.

through a series of generalisations from less comprehensive to more comprehensive classes. Thus, supposing we know the classes "plough," "spade," and so forth, we may group them as "species" under a more general class or "genus," *viz.*, "agricultural implements". With these we may take other things, such as carpenters' "tools," "surgical instruments," "machines," and the like, and bring them under a still more general head, "instruments of labour". Or we start from a more comprehensive class, say "man," and by introducing a logical "difference," *e.g.*, white and coloured, savage and civilised, proceed to less comprehensive ones included under the first.[1] This downward movement from the general to the particular is known as Logical Division. It proceeds not by a gradual elimination of differences but by a gradual addition of them, by what is called "determination". Thus the notion "figure" is further determined by the addition of the logical difference "rectilinear": this again by the addition of the differentiating quality "three-sided," and so forth.

The most elaborate examples of this orderly arrangement of things are seen in the classifications of the natural sciences, *e.g.*, botany. Any general notion, however, may thus be connected with other allied notions, and so the germ of a classification obtained. In this way we bring together the classes "house," "church," etc., under the higher class "building"; or, to illustrate the reverse

[1] Difference (*differentia*) as a logical term means the qualities which must be added to those connoted by the name of a genus in order to make up the connotation of the name of one of its species. For a fuller account of "genus," "species" and "difference," see Jevons, *Elementary Lessons in Logic*, lesson xii.

process, we divide the class "book" into sub-classes according to its purpose (amusing, instructive) or size (octavo, etc.). Even the notions corresponding to "abstract names" admit of this orderly treatment. For example, we can classify the several sorts of colour, and the several varieties of human character. In geometry, geography, and grammar there is ample room for more elaborate classifications.

THE DEFINITION OF CONCEPTS. A very important part of the logical regulation of the concept consists in what is known as *the definition* of names (or concepts). To define a name in the logical sense is to "unfold its connotation," to enumerate more or less completely the several characters or qualities which make up its properly understood meaning. Such a process of getting at the essentials of a name implies a careful comparison of instances, an analytical separation of the several common qualities, and *an explicit enumeration of these in words.* This last constitutes what is specifically known as definition. In this way, for example, a boy comes to know and to formulate in language the several constituent properties of "a square," "a metal," "a civilised country". Now we have seen that children go some way towards forming general ideas, for example, the generic images answering to the first ideas of "flower," "man," and so forth, before they are able to represent distinctly the several characters or qualities which form the connotation of these names. It is only as thought-activity develops that the more methodical analysis of concepts required for logical purposes becomes possible. When this has been carried out the mind will be able to retain the essentials of the concept by means of the

verbal definition. When, for example, a boy has learnt that glass is a transparent and brittle substance, composed of certain materials, that a civilised country is one which has government and laws, industries, and so forth, a firm apprehension of the group of properties by help of the verbal memory will serve to give distinctness to the concept.

A second and subordinate part of this process of definition consists in *the discrimination of the concept from other and allied concepts.* The precise meaning of a word is only brought out by setting the underlying concept over against its opposite or contrast, and by discriminating it from more nearly allied notions. Thus, for example, the notion "wise" is elucidated by contrasting it with "foolish," and further by distinguishing it from allied notions, such as "learned". Clear thinking implies a formed habit of carefully distinguishing words and their meanings one from another.

This process of definition involves a reference to a classification of things. What is commonly spoken of as "logical definition" implies this reference. The process may be described as follows: I want to define the name "iron," that is, to set forth the implied qualities of this substance. I view it as a "species" or sub-class, of a higher class or "genus," *viz.*, "metal". I then proceed to define it by saying that it is a kind of metal marked off from other kinds by certain "differences" or differentiating qualities, such as a particular weight (specific gravity), and so forth. Such a mode of defining is of great convenience in all cases where the number of characteristic qualities is great. By explaining that iron is a metal we at once tell a child (who knows what a

metal is) about it all that this name connotes. But this is not the only advantage. To define by naming "genus" and "difference" (or "differences") is to give the proper place of a concept in a system of concepts. When, for example, I define a square as a rectangular figure with its four sides equal each to each, I at once bring out the relation of square to rectangle, and, what is equally important, mark off "square" from "oblong". In the clear thinking out and naming of "differences," we have a valuable means of securing distinctness of concepts, in the sense of clear discrimination of one concept from the allied concepts.

The logical definition of a class-name, as just explained, must be carefully distinguished from the filling out of the denotation by enumeration of sub-classes. It is not, strictly speaking, a definition of the name "quadruped" to say that it is "a horse," "a cow," "a cat," and so forth. It is one thing to unfold the connotation of a name (logical "definition"), another to mark out the area of its denotation (logical "division"). Yet, as we have just seen, the two are closely connected. In logical definition there is a partial reference to class-relations. And this may well be supplemented by a fuller exhibition of these relations. As we saw above, our concepts are apt to grow indistinct (and, as a result of this, inexact) because the names are no longer kept in vitalising contact with real things. Now, one simple way of keeping a class-name in contact with things is by setting forth the principal sub-classes included under it. Thus the child who knows and remembers that "quadruped" consists of the familiar varieties, cow, sheep, dog, and so forth, is in little danger of using the name as an empty symbol. If he should forget for a moment what quadruped *means*, his knowledge of the field of denotation to which the name applies, that is to say, of the variety of four-footed animals, would soon enable him to recover the meaning of the term.

EDUCATIONAL CONTROL OF CONCEPTION.

RELATION OF THE EDUCATOR TO ABSTRACTION. The problem of exercising children in analysis and generali-

sation is one of special importance and of special difficulty. Its special importance depends on the fact that the systematic carrying up of knowledge of particulars into a general form underlies all that we mean by the higher or more scientific kind of intelligence. Its special difficulty lies in the fact that all the higher processes of abstraction involve a peculiar *effort*, which effort is, in average cases at least, only forthcoming where the forces of education are firmly applied. Yet even here it is easy to exaggerate the natural antagonism of the young mind to the processes of education. It has been the fashion, especially among school teachers, to say that children delight in the concrete, and find moving away from the concrete in the process of abstraction arduous and distasteful. But we are coming to see that much of their dislike for generalities is the result of bad methods of instruction, of "springing" the higher abstractions, such as those of grammar, too suddenly on their minds. As we have seen, children spontaneously occupy their minds in discovering resemblances among things and in the more simple kinds of generalisation. There is, indeed, a real intellectual satisfaction for a child as for an adult in waking up for the first time to a similarity between apparently dissimilar things. A young child's face may be seen to brighten on first discovering some similarity between things, as when a little boy twenty-six months old, watching a dog panting after a run, exclaimed with evident pleasure, "Dat like a puff-puff!" (railway engine).[1] And to some extent this pleasure may be utilised in developing the child's thought-activity. If only we take care to proceed wisely, to

[1] For other examples, see my *Studies of Childhood*, pp. 162 ff., 426 ff.

begin with simple exercises, and at the outset to supply the small learner with the necessary concrete examples out of which the notions have to be formed, we may find that the work of generalisation, though demanding an effort, will turn out to be interesting and even enjoyable.[1]

SIMPLE EXERCISES IN GENERALISATION. The training of the mind in thought-activity should begin in close connection with sense-observation. As pointed out above,[2] the analysis of objects into their constituent parts and qualities which underlies the perfected form of perception is a rudimentary exercise in abstract thought. Such analysis must at first be carried out hand in hand with the comparison of the particular object inspected with others. In this way, as we have seen, a child is led to apprehend the existence of qualities, such as the weight of a piece of clay or lead, by having the object brought into juxtaposition with other objects resembling it and contrasting with it in respect of its weight. It follows from this that *early lessons in the analysis of sense-presentations involve a simple exercise in arranging things in classes, that is to say, in generalisation* (cp. above, p. 204).

The more complete and methodical kind of exercise in generalisation aims at leading the child's mind to grasp the common qualities of a recognised group or class. Here the first all-important step is *a judicious selection*

[1] "There is nothing the human mind grasps with more delight than generalisation or classification, when it has already made an accumulation of particulars; but nothing from which it turns with more repugnance in its previous state of inanition" (Isaac Taylor).

[2] See p. 197.

of particulars for inspection. In making this selection the teacher should remember that it is first impressions which give the peculiar stamp to our ideas. A child who has first learned what an isosceles triangle is from the gable of a house will always tend to think of the form in this particular embodiment. Hence, the illustrative examples first brought under the attention of the pupil should be such as most clearly exhibit the characteristic qualities of the class, and therefore best serve as its representatives. In an elementary lesson on botany, specimens of leaf, flower, root, and so forth, showing the typical form, should be preferred to extreme instances diverging from the common type. In leading up to geometrical concepts, again, a teacher should make his representative instances typical, selecting, for example, as the first illustration of a rectangle one having a certain *proportion* between its two adjacent sides, so that it may at once be seen to have four sides, and yet two pairs of sides of unequal length.

In order to make the essential qualities prominent and impressive, and to reduce the attractive form of accidental individual accompaniments, the teacher will do well, wherever it is possible, to *isolate* the former. This is effected in geometrical teaching by presenting to the pupil the attribute of form in pure isolation from its accompaniments in concrete objects, such as its colour. The drawing of a straight line or a circle on the blackboard (though a very rough contrivance from a strictly mathematical point of view) is an enormous aid to the formation of a clear concept of what is meant

by these names.[1] This valuable expedient of isolation may further be made use of in lessons on number, in which, by employing small and unattractive objects, such as peas, children's attention may be led more readily to focus itself on the property of number.

It follows, from what has been said above, that a sufficient variety of instances must be supplied in order to ensure a distinct and accurate concept of a class. Nothing is more fatal to a clear and lasting apprehension of a generality than haste in slurring over the preliminary part of the process of generalisation, *viz.*, a due inspection and comparison of concrete examples.

No doubt a certain discretion is needed here. The number of instances necessary to a clear concept is not the same in every case. A teacher may easily confuse a child by introducing too many examples at one time. All true instruction means selection and simplification of nature's material, and the great thing at the outset is to present *fitting* examples. In certain cases, as Dr. Bain observes, it may not be necessary to go beyond these. One or two good illustrative instances of a single property, *e.g.*, transparency or weight, may suffice for a clear apprehension of the property.[2] On the other hand, it may safely be said that variety of illustrative instances is especially important in bringing out less obvious properties, such as number and form. The same is still more manifestly true in the case of classes of objects constituted by a

[1] As pointed out above, form, as conceived of by the geometrician, is not merely the result of abstraction or isolation, but involves a measure of idealisation (compare p. 321).

[2] *Education as a Science*, chap. vii., p. 197.

number of properties, such as metal, plant, and the like. Here it becomes important to exhibit as soon as possible something of the *range of variety* of the objects composing the class. Hence, while it may be right at the outset to keep to one or two representative examples, the teacher does well to take the child on to a discovery of the same characteristic group of qualities in widely dissimilar surroundings. In this wider search for "the one in the many" the teacher should make use of the child's mind, getting him to re-discover for himself the properties, first apprehended by the typical example or examples, in their new settings. To know something of the rich diversity of objects covered by the term "plant" is necessary to a full understanding of it as a class-name.

Once more, throughout this training of a child's mind in thought-activity the teacher should seek to combine the exercise of discrimination with that of assimilation. In developing the concept "transparent body," for instance, he should invite the child to distinguish between transparent and opaque bodies. Similarly, in unfolding the qualities of "plant" he should differentiate the class from that of "animal". In this way even the first simple exercises in generalisation should be made to subserve *classification*, that is, the due arrangement of classes in their logical order.

DEFINITION AND EXPLANATION OF NAMES. This exercise in the comparing and grouping of objects should be supplemented by supplying the proper name of the class, and enumerating in the form of a definition the several qualities detached by the process of generalisation. This part of the process is attended with its own

peculiar risks. It is often forgotten that definition is the *summing up* in a concise formula of knowledge already gained by observation. Definition does not precede, it follows the careful inspection of things. It is only when the qualities of things have been inspected and marked off by suitable names that a definition has any intelligible meaning for a child. Yet I am under the impression that I have heard a teacher begin a lesson in geography with a series of definitions of continent, island, and the rest, before making any attempt to elucidate by inspection of examples the nature of these classes of objects. Even in teaching a subject which is supposed to begin with definitions, like geometry, the teacher should aim at supplying direct knowledge of the things, *viz.*, the elementary forms—straight line, right angle, etc.—the nature of which is to be brought to light by the definition. It is coming to be recognised, too, that even in dealing with so abstract a subject as grammar the definition of verb, adverb, or other class, should follow and grow out of a comparative examination of concrete examples.

The logical rules of definition will be helpful to a teacher in supplying good definitions. The test of a good definition is that it enables us at once to recognise members of the class, and not to confuse these with members of other classes. In order to this the definition must be based on essential and not accidental qualities, and must enumerate a sufficient number of essential qualities. To define a "church" as "a building with a steeple," or a "metal" as "something hard and 'shiny' or lustrous," would be to define badly. Reference to a higher class (genus) may well be resorted to when

the pupil already knows this. Thus the easiest and most satisfactory way of defining the term "sledge," after showing a model or picture of the vehicle, would be by bringing it under the class "carriage," and giving as difference the presence of runners in place of wheels. If, however, the higher class is not already known, logical definition becomes impracticable. It would be absurd, for example, to define a whale as a mammal before the child had reached the idea of mammal. It may be added that in the early stages a teacher should not aim at the ideal perfection of definition required by logic. It is necessary to supply definitions of terms, *e.g.*, "plant," "metal," before a child is able to apprehend all the obscurer properties known to the botanist and chemist. The teacher's aim here must be to get *as near as possible* to a good scientific definition.

The true use of a definition is found in its application to new examples. When, for example, the term "cape" is defined (by help of an examination of examples) a child should be encouraged to find on the atlas *new* instances; similarly in the case of geometrical, grammatical and other definitions. We are apt to think that an abstraction is the goal of knowledge; in truth it is but the temporary resting-place. The real use of abstractions—save, indeed, those which, like the concepts of the higher mathematics, may be said to move in a sphere of their own, remote from that of reality—is to enable us *to think more meaning into what we see.* A child who has formed the concept "leaf," and attained by means of a good definition a precise knowledge of its general structure and function, is able to read more into the particular leaves which come under his observation. Only it must

be remembered, as Lange says, that such an application of a concept to the concrete "seldom comes of itself; it must be taught, shown and practised in every branch of study".[1] As already suggested, the teacher in unfolding and defining concepts on the side of their *connotation* should always have his eye on the wide and varied field of their *denotation*. If he wants his pupil's "conceptual knowledge" to be more than verbal, to be real and living, he must see to it that it is brought into touch, and kept in touch, with the rich manifoldness of the concrete world.

EXPLAINING THE MEANING OF WORDS. A special problem in developing children's conceptual thought arises from the circumstance that, since they come into contact with grown-up people's words and have a strong impulse to appropriate them, they begin to use them before experience has enabled them fully to grasp their meaning. As a result of this they go through a stage of partial apprehension, and even of misapprehension, of many of our words. Although this cannot wholly be avoided, yet, by taking pains to explain what is explicable to childish intelligence, a parent or teacher may greatly reduce the amount and the duration of this indistinct and confused conception. How important is it, for example, to explain to children the different meanings of the same word, and to exercise their minds in distinguishing between the primary, and the secondary and often figurative, signification. Children are wont to take all our expressions with literal exactness; and they should be

[1] See his volume *Apperception*, p. 225 f. This application of the concept to the concrete example will be dealt with more fully when we come to consider the completed processes of thought.

warned against this where it is likely to lead to misapprehension.[1]

Although he is called on in this way to explain words the educator must keep to the general rule, "things before names," or better, "*names only so far as made intelligible by, and required to supplement, knowledge of things*".[2] To *explain* a term is always and necessarily to make some appeal to childish experience, to the world of fact. Thus in explaining a moral term, *e.g.*, "unjust" or "faithful," the educator should take pains to go back to illustrations supplied by the child's own experience and the knowledge already assimilated by oral instruction and reading. Where, as in explaining many of the terms used in history, the instructor cannot thus appeal to quite pertinent examples in the child's experience, the utmost use must be made of the *analogies* which that experience affords so as to secure the construction of ideas, as clear as possible, of concrete examples.

The educator should keep jealous watch over the child's use of words with the view of correcting a slovenly application of them. Clear thinking finds its greatest aid in verbal expression, and children should be encouraged to express their ideas as clearly as possible. Pains should be taken to test their knowledge of the meaning of terms by getting them to supply examples and even to frame simple definitions. In-

[1] Instances of this and other kinds of misapprehension of meaning are given in my *Studies of Childhood*, p. 183 ff.

[2] Madame Necker well observes: "When the want of a word has preceded the possession of it, the child can apply it naturally and justly".

telligent children are quite able to do this, and will sometimes do it spontaneously. Thus a boy, nine and a half years old, once explained to a younger brother, aged six and a half, that a hymn "is a song sung in church," and the latter replied: "It is a song with long words in it". In both these definitions we have the form of logical definition by "genus" and "difference," though accidental qualities are substituted for essential in the "difference". By such means the educator can work against the baneful tendency to use words loosely and unintelligently, or it may be inaccurately. In thus insisting on a thinking out of the meanings of words we may be satisfied with a rough approximation to scientific accuracy, so long as the meanings are definite and clear to the child's mind. As knowledge widens the teacher should take pains to supplement and correct these first crude notions, substituting exact for rough and inexact definitions.

Order of Taking up Abstract Studies. The various subjects of instruction exercise the child's power of abstraction in a very unequal degree, and so should be taken up at different times. The amount of thought-activity involved in the formation of the more obvious classes of natural objects, such as "house," "bridge," "bird," is so slight that it may, as observed, be commenced in the first years in connection with the observation of the senses. More difficult exercises, *e.g.*, the building up of clear ideas of number and geometrical form, belong to the later kindergarten period. A careful thinking out of the class-relations of natural history, such as those of plants, presupposes a still higher development of thought-activity, of analysis, comparison, and discrim-

ination. A yet more decided leap is taken when we pass from these to the more difficult mathematical conceptions—as "square root," "proportionate figure," the abstruse notions of physics—as "rigid body," "mechanical work," the concepts of grammar—as "verb," "subject," and the more abstruse ideas of history and morals—as "state," and justice.[1]

The problem, When is it possible and most advantageous to take up these more abstract subjects? is one of the most perplexing ones in the art of education. Individual children appear to differ so much in respect of the rapidity of this side of intellectual development that no definite rule of universal application can be laid down. One may, however, safely say that in the past, and even in the present, the tendency has been to take pupils on too soon to these more severe intellectual exercises. It costs a far greater effort to think out one of these abstractions at the age of ten or twelve than at the age of sixteen, and in the end it is not so well thought out. Here the difficulty is not so much the want of a sufficient range of observation—though this is important—as the want of the power of thought and of the adequate development of the higher organs of the brain on which this power is known to depend. In spite of the pressure put on teachers to urge forward their pupils, especially the clever ones, they will be wise to remember that in all that exercises thought the "short-cut" is essentially the longer route.

[1] One of the knotty points in this question of order of abstractness is the proper position of Grammar viewed under its more logical aspects. See Bain, *Education as a Science*, p. 213.

REFERENCES FOR READING.

For a fuller knowledge of the fundamental processes of thought and the formation of General Ideas, the following may be referred to: Sully, *The Human Mind*, chap. xi.; J. Ward, article "Psychology" in the *Encyclop. Britannica* ("Intellection," p. 75 ff.), and G. F. Stout, *Analytic Psychology*, vol. ii., chaps. ix. and x. The reader of French may with advantage consult Th. Ribot's volume, *L'Evolution des Ideés Generales*. The development of the notion of Self is specially dealt with by W. James, *Psychology*, chap. xii.

The early development of General Ideas in connection with that of Language is illustrated by H. Taine, *On Intelligence*, part i., book i., chap. ii., section v.; B. Perez, *The First Three Years of Childhood*, chap. x., sections ii.-iv. (and more fully in his later work, *L'Education intellectuelle*, chaps. iv.-vi.); W. Preyer, *The Development of the Intellect*; G. Compayré, *L'Evolution intellectuelle et morale de l'enfant*, chap. xi., and Sully, *Studies of Childhood*, chap. v.

On the training of children in orderly processes of conception the student may consult A. Bain, *Education as a Science*, chap. vii., pp. 191-197; Lloyd Morgan, *Psychology for Teachers*, chap. v., and S. S. Laurie, *Institutes of Education*, part ii., lecture vii. On the management of language in connection with these exercises, he may further consult Lloyd Morgan, *op. cit.*, chap. viii.

Among foreign works the following may be mentioned: E. Rayot, *Leçons de Psychologie*, xii. and xv.; H. Marion, *Leçons de Psychologie*, xlii.; F. Queyrat, *L'Abstraction et son rôle dans l'Education intellectuelle*; Beneke, *Erziehungs und Unterrichtslehre*, §§ 26-28 and 30-38; Waitz, *Allgemeine Pädagogik*, §§ 21, 22; Dörpfeld, *Die schulmässige Bildung der Begriffe* (published by Bertelsmann, Gütersloh).

CHAPTER XIV.

THOUGHT-ACTIVITY: (B) JUDGING AND REASONING.

THE process of conception unfolded in the last chapter is incomplete thought-activity. In order to think in the complete sense we require not only to have general ideas but to discover and set forth the relations of these to objects. A full, explicit setting forth of such relations is what we mean by judging. Thus I judge when I say that this particular figure is a rectangle, *i.e.*, possesses the characteristic qualities of the rectangle. A yet more full and complex process of thought grows out of this judging, and is known as reasoning (compare above, p. 310 f.). The two processes are so closely connected that it will be found most convenient to deal with them together.

THE PROCESS OF JUDGING.

MEANING OF JUDGMENT. In common life we say that a man judges when he comes to a decision about a question, as when the judge decides a matter in a court of law. This presupposes a question, room for doubt, and a more or less complicated process of weighing evidence. In mental science the term is used in a more comprehensive sense. *We judge whenever we go through any mental process which ends in a proposition, i.e., in an affirmation or negation of something.* Thus I am said

to judge when I observe anything in an object, and pronounce on this, as in saying, "This flower is a rose," or "This rose has a rich perfume".

This process of judging illustrates the two fundamental elements in thought-activity, *viz.*, analysis and synthesis (compare above, p. 307 f.). It is evident that before I can think, "This stone is a flint," or "This plate is dirty," I must analyse what is presented. In the former case I specially focus attention on the group of flint-marks in the object before my eyes; in the second I selectively note the appearance of dirt and its local relation to the plate as a whole ("on the plate"). While, however, judging frequently implies analysis, it even more evidently implies synthesis. *To judge is clearly to discern and to mark off as a special object of thought some connecting relation.* Thus in judging that the letter O is an oval I mentally "relate," *i.e.*, bring into mutual relation, the shape of the letter and the oval form. *All judging is thus keeping two ideas distinct as two ideas, and at the same time combining them by help of some relation, such as similarity, or proximity in place or time.*

The result of the process of judging when properly set forth in language is commonly called a "judgment". Whether we can judge without putting the result into a clear verbal form is a disputed point: what is certain is that all clear discernment of relations expresses itself in language, audible or silent. The verbal form in which every result of judging admits of being expressed is a statement, or what logicians call a Proposition. The "subject" of the proposition answers to the thing about which we affirm (or deny), and the "predicate" to that

which is affirmed (or denied). Thus, in saying that "Fire warms," a person is affirming of the fire (the subject), the possession of a certain power, *viz.*, that of warming (the predicate).

Now, in thus "predicating" something of a subject we are representing and apprehending as such what we call fact or reality. When a child says that his food is hot he is telling us something about the real world, or at least that portion of it which is now present to his senses. Thus *to judge is to decide about a real state of things, and a judgment properly clothed in language is always a declaration about the real world.* This applies alike to judgments about external objects and events, and the equally real world of our impressions and feelings. This being so, every judgment is from a logical point of view regarded as true or false according as it correctly represents or misrepresents the sphere of reality. *Our judgments are only true when we mentally relate things in accordance with their real or objective relations.*

From this short account of the process of judging it may be seen that it is coextensive with the whole of our knowledge. Everything that we know or suppose that we know involves an element of this process, and, when it becomes distinct knowledge, is susceptible of being explicitly set forth in a proposition. Thus, as we have seen, in our everyday acts of perception we mentally apprehend a real tangible object lying at a particular distance from us. As soon as we analyse our percept and think out the relations implied, we reach rudimentary judgments, *e.g.*, "This object lies in front of me, so far off, is of such a colour," and so forth.

Relation of Conception to Judging. It seems evident that judging, as connecting two ideas one with another, is a more complex mental process than conception. Every explicit and definite judgment implies a concept already formed. We cannot affirm anything of a concrete individual object, as when we say, "This is a fossil," or "This substance is transparent," without already having the idea of fossil or of transparency. Indeed, our judgments about individual things, the first which we form, are commonly described as applications of our concepts to new individual instances. In saying that this object is a fossil we pick out and recognise, by help of our previous conceptual knowledge, the group of characters which is decisive as to whether a thing is a fossil. In other words, *the possession of a concept enables us to recognise the "one in the many," to say what general characters the concrete object now presented to us possesses and how it is to be classed.*

On the other hand, although the judgment in its perfected verbal form seems to presuppose the concept, it must be remembered that the formation of the concept itself, just because it implies a true thought-process, involves a simple kind of judging. Thus a child in forming the idea "heavy" has to compare heavy objects and to relate them as agreeing each with each in respect of this quality, and this clearly includes a number of simple judgments. So again, in building up the more complex concepts, such as "metal," a child has to combine or "synthesise" into a single whole a number of qualities, *e.g.*, weight, hardness, metallic lustre. Now this work of combining qualities can only advance gradually as the child widens his knowledge of the properties of the

object. Every such extension takes place by a process of judging, *e.g.*, "The hard heavy bright thing (metal) is also a conductor of heat".

We may say, then, that *our concepts are formed by help of a series of simple processes of judging, and conversely the development and improvement of our concepts prepares the way for a clearer and more exact kind of judgment.*

PRINCIPAL CONDITIONS OF JUDGING. It is easy to see from this account of the process of judging that it can only be carried out when certain conditions are realised.

(*a*) To begin with, before we can judge we must have *the requisite materials* for forming a judgment. These are supplied either by our own individual experience or by what we learn from others.

It is evident that the ability to judge about any matter presupposes not only a close examination of what is presented at the moment but a careful process of observation and of analysis in the past and a ready reproduction of the results of these processes. I cannot decide whether this flower is an orchid, or this stone an onyx, unless I have already carefully observed examples of each class and mentally marked off its distinguishing characters.

With respect to what we learn from others, it is to be noted first of all that a child who acquires and assimilates most from his parents, teachers, and others, will have much more material with which to judge. But in order to use this he must not merely adopt passively and mechanically what is told him, but must *think it out for himself*, analysing it and detecting its relations to other things which he knows.

(*b*) In the second place, to judge is to carry out a *process of reflection* on given materials. This again means that a special effort of will is put forth in focussing attention on this and that aspect and relation of our experience. Children are incapable of judging about most things, partly because they lack the materials and partly because they have not sufficient power of will to carry out the difficult focussings of attention involved.

This controlling action of a steady purpose to think out a matter is much more difficult when feeling and prejudice oppose us. An important element in good judging is the power to repress feeling, to look at things with calm, unprejudiced eyes. Here, again, we see how it is that children often fail to judge rightly.

(*c*) Since to judge explicitly and perfectly is to cast one's thought into clear and suitable language, it follows that a last condition of judgment is *the mastery of the verbal medium employed.* As long as any haziness clings to our words we cannot use them properly for expressing our thought. Children are greatly handicapped in setting forth their thought by their imperfect grasp of language. They cannot describe an object they have seen, setting forth precisely its relations of place and so forth, because they cannot readily use our highly articulated language with its adjectives, adverbs, prepositions and other elements.

Early Development of Judgment. The judgment in its perfected articulate form is reached gradually. A child a year old will, as we have seen, name objects, and thus show that he is able to form rudimentary notions about them. Thus he will recognise a dog by pointing to the object and exclaiming, " Bow-wow ". These " re-

cognition-signs" may be regarded as rudimentary judgments. It is, however, a considerable step from this to the setting forth of the qualities of things and of the relations between things by means of a sentence, which usually begins in the second half of the second year.

These first judgments have to do mainly with the child's food or other things of great practical interest to him; *e.g.*, the early form of statement: "Ka in milk" (something nasty in milk). Towards the end of the second year the range of discernment shows a marked extension, the child coming now to observe and remark on anything new or striking in the objects that present themselves, such as the unusual size of a dog, the unusual position of a sister lying on the floor. As the observing powers grow, and the child's interest in things widens, the number of his judgments increases. And as his powers of comparing objects and detecting their relations develop, his judgments gradually take on a more penetrating character. This progress in affirming is of course dependent not only on the growth of a finer and more penetrative apprehension of relations, but on advance in the command of words and in the constructive skill required for framing sentences.

An important step is taken when a child learns not only to affirm but to deny. The use of negative signs is greatly aided by the habitual employment by others of *questions*. A question when understood brings home to the mind of a child the alternative between what we call the truth and falsity of a proposition. The way in which the negative particles are first used is very instructive. A child of three was in the habit of framing a statement and then appending the sign of

negation thus: "N. (his name for himself) go in water—no". It was observed, further, in the case of two children that during the third year they were apt to couple affirmative and negative statements in this fashion: "This I's cup, not mama's cup"; "This a nice bow-wow, not nasty bow-wow". This suggests that children when they reach the distinction between affirmation and negation *think out the relation of opposition between a proposition and its contradictory*.[1]

The development of the power of judging is marked by the growth of a cautious and critical spirit in relation to affirmation. Things and their relations are more finely discriminated, and, as a consequence of this, are described more clearly and minutely. Again, the tendencies to exaggeration and misstatement due to the influence of feeling (*e.g.*, the desire to astonish or amuse) are gradually checked, and so the judgments gain in point of accuracy. Along with these changes, we may note that the earlier impulse to give reality to the productions of fancy is brought under control. A child's growing experience enables him to fashion a rudimentary standard of what is possible and impossible, probable and improbable; and as a result of this he becomes more cautious in making assertions, as also in accepting those made by others.

DIFFERENCES AMONG INDIVIDUALS IN THE ABILITY TO JUDGE. It is a matter of common observation that individuals, adults and children alike, show marked diversities in their power of judging about things. Some are slow to form a judgment, and are apt to be hesitating

[1] On children's first experiments in sentence-building, see my *Studies of Childhood*, p. 170 ff.

and uncertain ; others are ready, others again impulsive and rash. The differences of experience among persons, as also of their power of observing and recalling what they observe, all affect the ability to form clear and certain judgments. We each of us judge best about things which we know best, and the same is true of children. As pointed out more than once, our ability to judge depends on our having clear general ideas of things. A child that has carefully observed and classified animals, ships, and so forth is in a better position to pronounce on any new example of these.

LOGICAL REGULATION OF JUDGMENTS.

PERFECTIONS OF JUDGMENT: CLEARNESS. As in the case of the general idea so in that of the judgment, it is the business of Logic to bring the product of thought-activity to its perfect form, to see that it is embodied in perfectly clear and unambiguous language, and to secure exact conformity between it and what we call reality.

A very little examination is sufficient to show that our every-day judgments are apt to be imperfect in point of clearness as well as of objective accuracy. The judgments of the young and the uneducated tend to be indistinct in a number of ways. A common cause of this indistinctness is imperfect observation together with defective analysis of what is observed. This is apt to give rise to a vague apprehension of some relation of things, though the exact nature of this relation is not made clear to the mind. Thus a hazy-minded boy will tell you that he has seen a flock of wild birds, but cannot say whether they were near or far above his head or in what direction they were flying. Similarly he cannot narrate a simple

occurrence so as to put the several incidents in their right order of time. Again, defects of memory by leading to indistinct reproduction are a great obstacle to clearness of judgment. If we fail to recall the exact qualities of an object, we shall of course only be able to make vague assertions about it.

Again, it is to be noted here, as in the case of concepts, that what was once clear may become hazy or indefinite by the divorcing of words from ideas. When a boy forgets the facts on which a principle is based he has no longer a clear mental apprehension of its meaning and truth.

Once more, the intrusion of feeling into the intellectual domain inevitably leads to vagueness of judgment. What we call childish exaggeration is a striking illustration of this. The emotions of wonder and fear are apt to lead a child to "pile it on," as we say, in describing what he has seen; and this exaggeration precludes the finer and more precise kind of judgment.

Vagueness of judgment is apt to show itself in a special manner in those opinions which we passively adopt from others without seeking to make them our own by personal observation and reflection. What a child learns on others' authority without bringing it into organic connection with the facts of his own experience always has something of this vagueness.

The study of Formal Logic helps us to throw our judgments into as clear a form as possible. Here we have carefully to analyse our statements, setting forth the subject and the predicate, to say whether we are affirming or denying a predicate of a subject, also what is the "quantity" or range of our assertion, that is to say,

whether we are asserting something of an individual only, of a whole class, or of a part of a class. The exercises of Formal Logic help us, further, to see all that is implicitly affirmed in the assertions which we make, and, on the other hand, all that is implicitly denied in them.

ACCURACY OF JUDGMENT. Again, our judgments, like our general ideas, may be accurate or inaccurate. An accurate judgment is one which corresponds precisely to the realities which it represents, or which faithfully expresses the actual relations of things. Want of clearness in judging is very apt to lead on to inaccuracy of judgment. Propositions which are not clearly understood tend to be *mis*understood. The more flagrant forms of inaccuracy arise from inaccurate observation and inexact reproduction. To this may be added, especially in the case of the young, the misapprehensions into which they are apt to fall when trying to understand our language.[1] Strong feeling, too, leading us to expect and desire that things should be so and so, may bring about a considerable divergence of statement from reality.

In addition to these sources of inaccuracy, we have to recognise the imperfections and limitations of each individual's experience. Our judgments are the outcome of our special type of experience, our individual associations. A child with a loving thoughtful mother will form a very different opinion about mothers from that formed by a child who is so unfortunate as to have a hard and unsympathetic one. Accuracy of judgment thus presupposes an interaction between the

[1] Examples are given in my *Studies of Childhood*, p. 183 ff.

individual and the social or general intelligence. In this way our judgments are assimilated to the common type and so take on an "objective," as distinguished from "subjective," validity.

OTHER QUALITIES OF JUDGMENT. In addition to clearness and accuracy, logic requires our judgments to have other perfections. By demanding that the statements we make be true to known facts, it virtually demands that they be held to—at least until new evidence shows them to be untrue. In this way it acts restrainingly on our natural impulsiveness and capriciousness. It insists on our taking sufficient pains to see that we are right before we pronounce an opinion, and that having formed an opinion we do not lightly and thoughtlessly cast it aside.

It may be well to add that this logical control of judgment does not require us to refuse to reconsider our opinions in the light of new facts. Obstinacy of belief, in the sense of unwillingness to correct narrow and inadequate opinions, is clearly a fault. A person who recognises how narrow his field of experience really is when compared with that of the whole human race will cultivate a certain openness of mind. We can only approximate to the logical ideal of just and sound views of things by long and painstaking processes of self-correction.

In like manner the logical requirement of objective validity does not mean that we are to sacrifice individual conviction in order to conform to the opinions of those by whom we happen to be surrounded. On the contrary, it rather imposes on each of us the duty of thinking out things for himself, so that the truth of things may be

gradually reached by a co-operation of many individual minds. Thus a certain measure of independence is an indispensable quality of judgment.

INFERENCE OR REASONING.

In the process of judging we merely establish a relation of thought between a subject and a predicate. Such a process may, as we have seen, grow immediately out of observation—as when I say, "This is chalk,"—or out of memory—as when I say, "I saw the flag flying yesterday". From a mere process of judgment of this kind we have to distinguish *a judgment which results from a process of inference.* When, for example, I notice that the sky is overcast, and predict a shower of rain, my assertion is clearly the result of an inference. I regard the overcast sky as a *sign* of rain, and infer from the presence of the one the oncoming of the other.

Process of Inference. It is evident from the above example that inference is based on the detection of similarity among our experiences. I predict the shower because I *analyse* the presentation of the sky and *identify* certain of its features as similar to what I have seen before. With this assimilative analysis there goes a process of *synthesis* or combination by help of contiguous suggestion. The presentation of the dark lowering sky calls up the idea of rain; and this idea, when combined with the presentation, becomes an *expectation* of rain. Inference is thus *a movement or transition of thought from something known to something heretofore unknown, but now known as a conclusion from the first.*

Inference takes on a lower and a higher form. In the

former the mind passes at once to a new and as yet unknown fact without clearly setting forth the ground or reason of the conclusion. Thus a child will infer that this water will wet, that this grown-up person will be able to tell him something he wants to know, and so forth, without distinctly recalling the fact that other water has made things wet, that others have satisfied his curiosity. This is presumably the way in which the lower animals proceed when inferring as to the proximity of prey, of their enemies, and the like. And children begin by drawing conclusions in this informal and unreflective manner. A step towards a more reflective process of inference is taken when a child distinctly recalls some fact or facts of past experiences, and applies this by way of analogy to a new case, as when he argues that pussy requires bathing and wiping because he himself is subjected to these operations by the nursery authorities. Here there is a full conscious transition of thought from some known fact *to a similar or analogous case.*

A still more reflective and complete process of reasoning takes place when a child is able by help of general ideas and names to seize and set forth to his mind *a general truth,* making this *the reason* or ground of his conclusion. When, for example, he reaches the universal truth that adults are better informed than children, and consciously reasons from this that the grown-up stranger, A. B., will be able to tell him something, he may be said to reason in an explicit and formally correct or logical manner.

The advantages of this procedure by way of general truths or "principles" are manifest. To begin with, it is a great simplification of our mental processes, a great

economising of our forces, to bind together, in memory, a multitude of "particulars" in a general proposition. In the second place, it is only when we have such general truths at our command that we can reason with precision and certainty. So long as a child passes directly from one fact to another on the ground of similarity or analogy, his conclusion is more or less precarious. If, for example, a boy infers that a piece of wood will float because other pieces tried by him have floated, he may make a mistake. If, however, he first satisfies himself on the general question whether all sorts of wood float, he will be able to conclude with certainty. All the higher processes of thought, including the whole of what we mean by science, are illustrations of such explicit or logical processes of reasoning. *They are reasoning at its best.*

Relation of Judging to Reasoning. We may now understand the relation of judging to inferring. In its higher or more developed form reasoning presupposes judging. Formally considered, reasoning is passing from certain judgments to other judgments recognised as following from the former. Thus before a boy can explicitly argue that a particular substance will float in water he must have already thought out the judgment that all substances of a certain order (*e.g.*, those lighter than water) will do so.

While, however, judgment is thus a pre-condition of the more reflective or logical type of reasoning, it must not be forgotten that there is an element of inference in a good deal of what is commonly described as judging. Even in the simple act of recognising an object by certain visible marks, the mind commonly goes beyond what

is actually observed at the moment. If, for instance, on looking at a stone on the road, I say, "This is a flint," I virtually assert about it more than I at the moment perceive, *viz.*, that it is hard, that it can be split, etc. And this ingredient of inference becomes much more distinct in certain complicated processes of judging, *e.g.*, as to the genuineness of a coin or a picture.

Finally, it is plain that every process of reasoning ends in a judgment as its result or conclusion. In other words, whenever we reason we carry out a new process of judgment.

To sum up: *to judge and to reason are closely connected mental processes. Our reasoning processes help us in reaching and firmly establishing our judgments; whilst, reciprocally, our judgments, when reached, become starting-points for new processes of reasoning.* The relation between the two is thus very similar to that between conception and judging.

INDUCTIVE AND DEDUCTIVE REASONING. The full explicit process of reasoning by way of a universal judgment is commonly said to fall into two parts or stages. (*a*) Of these the first is the process of mentally reaching a general truth or principle by an examination and comparison of facts: this is known as Induction. (*b*) The second stage is the process of applying the truth thus reached to some particular case: this is known as Deduction. Induction is an upward movement of thought from particular instances to a general truth, principle, or law: deduction is the reverse downward movement from some general principle to a particular conclusion.

(*a*) NATURE OF INDUCTIVE REASONING. The process of inductive reasoning may be defined as *the setting*

forth under the form of a universal truth of some attribute or relation which has been observed in a number of variable particulars.

This inductive process is illustrated when a child discovers the permanent qualities of an *individual* object. That "this knife cuts," that "this pussy scratches," is a kind of universal truth reached by a comparison of a number of particular instances in which the object in question has cut or scratched. Here the child's mind analyses, compares and combines, so as to reach a proposition which is true of the individual thing permanently or *at all times*.

As commonly described, however, induction goes beyond the individual thing and discovers what is true of many individuals or a "class of things". Thus a child observes that his toys, spoons, knives, he himself, and a vast multitude of other objects, when not supported fall to the ground. Little by little he compares these facts one with another and seizes the essential circumstance which runs throughout them, and the general truth which is implied in them. He notes that what all these things have in common is that they are what we call substantial. He then detaches this common circumstance, and along with it the incident (falling to the ground) which has invariably accompanied it. That is to say, he judges that all substantial bodies tend to fall.

It is obvious that in reaching a universal truth of this kind the young investigator is going far beyond the limits of actual observation. For the proposition, just because it is a general or universal one, covers the case of every hard or resistant substance *wherever and whenever met with.* It is thus a true process of inference or

transition from what is known to what is heretofore unknown.

This process is clearly related to that of generalisation described above.[1] In each case we trace out a similarity running through a diversity of things. The difference is that whereas in the case of generalisation we assimilate things merely as such, forming what is called a "class," in the case of induction we assimilate *relations among things*.

It may be added that, just as there are higher and lower conceptions, so there are higher and lower inductions. The child commonly begins with a number of narrow inductions, *e.g.*, "flies die," "birds die," and so forth. He then reflectively compares these one with another, and extricating what is common to them, reaches the higher truth, "All animals die". Later on he couples this with the kindred truth similarly reached, "All plants die," and so arrives at the yet more comprehensive general truth, "All living things die".

A like process of comparing instances and analytically separating out what is common to these from their variable accompaniments takes place in that important class of inductive reasonings which has to do with the relation of cause and effect. It is in this way, for example, that a child finds out that burning or combustion is a common cause or source of heat.

(*b*) DEDUCTIVE REASONING. By means of the inductive processes just described a child reaches a large amount of general knowledge about things, including the pro-

[1] Indeed induction is often called generalisation, as when we speak of "a hasty generalisation," meaning a general statement hastily built up from fact or experience.

perties of substances, the causes of movements, and generally of the changes which go on in things, the laws that govern human action, and the simpler truths which set forth the relations of time, space, and quantity, including number. In arriving at these, he is of course greatly aided by others' instruction. In many cases, indeed, he derives his first general knowledge from what others tell him, though even in these cases the knowledge only grows clear and real after the learner has observed and collected illustrations of the truth from his own experience.

When he has thus amassed a certain quantity of general knowledge he is able to pass on to the second stage of explicit reasoning, namely, Deduction. By this is meant reasoning downward from a general truth or principle to some special case or class of cases. When a child has arrived, by way partly of observation and partly of instruction, at the universal truth that all persons are liable to make mistakes, he is apt to apply the truth by arguing that his mother or his governess makes mistakes. Here, again, the process is based on analysis and identification, supplemented by combination or synthesis.

The type of deductive reasoning, when fully set forth as Logic requires, is known as a Syllogism. This consists of three parts, as in the following example:—

> All animals suffer pain (major premise).
> Flies are animals (minor premise).
> Therefore they suffer pain (conclusion).

It is to be observed that although all reasoning, inductive and deductive alike, proceeds by the detection of likeness in things it involves a measure of discrimination as well. Thus when a child is finding his

way to the simple proposition that ripe gooseberries are sweet, he must, it is evident, distinguish between instances of the ripe and the unripe fruit. Similarly in the case of deductive reasoning. In the arguments by which we reach negative conclusions we are especially engaged in distinguishing or marking off things one from another. Thus, when a parent, reasoning with his child, says, "That boy is not a gentleman, for no real gentleman despises the poor," he is discriminating between the genuine marks of a gentleman and those which point to a vulgar, or ungentlemanly type of mind.

Application of Principles and Explanation. Deductive reasoning may begin at one of two ends, so to speak. We may, first of all, have a principle given us and be asked to draw conclusions from it. This is known as applying a principle, or finding new illustrations of a truth. In this way, new discoveries may be made by a skilful combining of truths which are already known. When, for example, a child learns about the sharp incisor teeth of the rodents or "gnawers" and then finds out that the squirrel is a gnawer, he will be able to draw for himself the conclusion that squirrels possess such teeth. In this way the mind is able to go in advance of observation, and to conclude beforehand as to how things happen.

In the second place, we may set out not with a general truth, but with a particular fact, and seek for some general truth under which it may be brought. This is known as explanation. In its simplest form, explanation is throwing light on a new and unfamiliar fact by pointing out its analogy to some familiar fact. This is the only explanation available in the case of young children

who cannot as yet grasp general principles. A higher kind of explanation consists in deducing a particular case from a general principle. Thus a boy explains to himself the fact that the whale has to come to the surface of the water to breathe when he connects the fact with the truth that the whale breathes by means of lungs.

CHAPTER XV.

THOUGHT-ACTIVITY: (B) JUDGING AND REASONING (CONTINUED).

Growth of Reasoning Power. The development of the power of inferring or drawing conclusions proceeds in close connection with that of the ability to judge. At first, as already observed, the process is instinctive or implicit and not reflective. The child draws a conclusion about the taste of this fruit, or the use of this tool, because it is recognised as like what has been already observed. The first illustrations of this instinctive process are seen in striking out new lines of action by help of analogies with previous experience. This is commonly described as adapting means to ends. Young children's devices for asking for things by gesture signs illustrate this process.

This informal process of inference is further seen in early childish *expectation*. When, for example, an infant shows by his gestures and cries that he knows the meaning of pouring water into the bath, of putting on his outdoor clothes, and the like, it is evident that there is something like inference from present signs to the coming experiences signified.

A more advanced process of reasoning begins to show itself when the child acquires the use of language. Thus

a little boy was told by his father not to eat some brown sugar which he was taking out of a bag. He answered promptly and emphatically, "Ni!" (*i.e.*, nice). This was clearly finding a reason by way of justification, "I eat it because it is nice".

FIRST INDUCTIVE REASONINGS. When he grows proficient in the use of language the child proceeds to carry out a rude process of inductive reasoning. Needless to say, the conclusions drawn are often hasty enough. Here is an example. A boy of two and a half was accustomed to dwell on the fact that he would in time grow to be big. One day as he was using a small stick as a walking stick his mother told him it was too small, on which he at once remarked: "Me use it for walking stick when stick be bigger". He had implicitly argued that other things besides living ones tend to grow bigger in time. The inductions of the young and of the uneducated are often of this type. The tendency of all of us is to argue that what is true of ourselves, and of our own little sphere of observation, is true of mankind and of things generally.

CHILDREN'S IDEA OF CAUSE. As observed above, inductive reasoning has to a large extent to do with the detecting of causal relations, and children's reasonings are largely directed to the causes of things. How things are made, how they become just what they are—these are problems of the greatest interest to the intelligent, inquiring child.

According to Herbert Spencer and some other psychologists, children have a congenital tendency to think of things as having each its cause and explanatory reason.[1]

[1] Compare what was said above, pp. 78, 79, on Spencer's theory of Heredity.

However this be, a child's mind will be led to think about causes by noting the regular sequences of events, *e.g.*, the taking of food and the satisfaction of hunger, violent contact with a hard body and an unpleasant bruise. He notes too that others habitually ascribe what happens to the action of things, and explain effects by ideas of causal agency. In this way he begins dimly to apprehend the truth that changes are *produced*, or have their causes, though it is many years before this truth grows perfectly clear to his mind.

There is reason to suppose that a child models his first idea of cause on the pattern of his own actions. His first inquiries are often of the form: "Who made the snow?" or "Who made the flowers grow?" The production of natural changes is thought of as effected by actions analogous to his own. The full development of this tendency to assimilate natural processes to human actions ("anthropomorphism") is seen in the common supposition of children at a certain age that everything has its use or purpose. The meaning of the question, "Why?" in the mouth of a child of three or four seems equivalent to, "For what purpose or end?" This form of question suggests that the young conceive of all changes as directed to an end, just like the changes which they themselves voluntarily bring about. It is only after a certain development of intelligence has been attained that they learn to distinguish between the sphere of human action with its determining purpose or end, and that of natural or physical causation.[1]

EARLY REASONINGS ABOUT CAUSES. The early

[1] For a fuller examination of children's notions of the processes of nature, see my *Studies of Childhood*, chaps. iii. and iv.

attempts of children to think out the causal connections between things are apt to result in crude or hasty generalisations. The noting of only a very slight analogy between things often leads a child to conclude that they are produced in the same way, or have a common cause. This tendency may produce amusing results: for instance, a boy two years and ten months old said one day that he would put water on some bits of bread lying on his plate in order to melt them. He here reasoned badly from the analogy of dissolving his sugar in milk.

Hasty induction with respect to causes shows itself too in other ways. The desire to find how a thing has been produced or "made" often leads a child to fix his mind on any attendant circumstance, though this may be only accidentally present in the case, and have nothing to do with the effect produced. Thus the same little boy at the age of two argued that milk was white because it came from a white cow which he had happened to see.

Again, the childish mind is apt to argue erroneously that a thing is always produced by one and the same cause. The child just quoted, when two years old, having scratched himself, and being asked how the blood came on his hands, said, "Fell down on path"; and a few months later argued that the slipping off of his glove was the result of the wind blowing it off.

Such crude childish reasoning gradually gives place to a more careful type of generalisation as the mind develops a finer ability to analyse and compare what is seen. In this way things get connected with their proper adjuncts and causal antecedents. Not only so, this same development of thought-activity leads to a

mental grasp of truths of a wider and more abstract character. At the same time the growth of discriminative power leads to a more careful discernment of the several elements of experience, and so to greater caution in making general statements. Thus children from about the end of the fourth year may often be observed to use the expressions, "some persons," "many persons," "generally," and so forth.

Early Progress of Deductive Reasoning. The same line of remark applies to the early development of the process of deductive reasoning. A boy of three or four will begin to apply simple rules to a particular case. He will argue, for example, that nurse is naughty because she does something which he conceives of as a naughty action. As this example suggests, however, he is very apt to reason carelessly, to apply rules to cases too hastily from a vague feeling of resemblance, and without inquiring whether there are points of difference which exclude the particular case from the rule.

Progress here manifests itself in two ways: (*a*) It is seen in the thinking out of the less obvious applications of a rule or principle. A child, as he grows more thoughtful, will be able to bring the ascent of the balloon under the principle of bodies floating in water, to recognise a breach of the law of kindness in such things as practical jokes and rudeness. Intelligent children of six or thereabout delight to apply the general truths they possess to new and less obvious cases. (*b*) Progress is further seen in the appearance of the discriminative caution already referred to. A thoughtful child is not only quick and penetrating in discerning new applica-

tions of rule, he is critical in his applications, distinguishing cases where the reason or explanation fits from those where it does not fit. A marked advance in deductive reasoning which comes distinctly later is seen in the ability to follow out *a chain of reasoning* such as is illustrated in a demonstration of Euclid.

INDIVIDUAL DIFFERENCES OF REASONING POWER. Differences in the development and perfection of thought-activity reflect themselves in the inequality of the reasoning processes as carried out by different individuals. To reason well about things is to show thought-activity in its most complete form. Great contrasts present themselves in this respect if we compare with a scientifically trained mind the untrained mind of a peasant or of a child. In addition to such obvious general dissimilarities there are the less obtrusive differences which are connected with the prevalent manner of reasoning and the realm of knowledge in which the mind is most at home. In this way we get the "inductive" type of mind, which is skilful in the observation and analysis of facts, and in tracing out the laws of phenomena, and on the other hand the "deductive" type of mind, which is interested in abstract truths rather than in concrete facts, and is ready in combining these into an orderly argument. The former is illustrated in the physical inquirer, the latter in the mathematician. In this way, too, we find that superiority in carrying out the reasoning process is commonly confined to some particular and limited sphere of knowledge, say some department of practical affairs, or of physical science. All such differences in ability to reason about things turn, like other intellectual inequalities, partly on differences of congenital aptitude,

and partly on differences in circumstances and mode of education, and, more generally, range of practice.[1]

MEASUREMENT OF REASONING POWER. What has been said about the difficulty of measuring conceptual power applies with greater force to reasoning power. Judgment may, indeed, be tested in simple forms in connection with the experiments already referred to, which ask the subject to decide which of two colours submitted for inspection is the brighter, and so forth, and estimate the exactness (by percentage of errors) of the answers. The influence of a preconception in biasing judgment has also been examined in the case of children. Thus they were asked to judge how heavy a large object was by lifting it *after looking at it.* The result showed that the expectation of great weight from looking at the size biased the judgment, making the child pronounce the object to be heavier than it really was, and that this effect of bias or "suggestion" was greater in the case of children than of adults. With regard to reasoning power, it has been suggested that children's ability might be tested by setting them simple arithmetical problems, and comparing the time taken and the percentages of errors. The method of measurement suggested by Ebbinghaus, *viz.*, asking school children to fill in lacunæ in a piece of printed matter, might be so arranged as to test reasoning as well as imaginative power (see above, p. 290). Perhaps one of the best tests for older children would be readiness in working out riders in geometry. Of course, care would have to be taken in varying the subject-matter of such experiments so that *all sides* of the reasoning faculty were included.

LOGICAL REGULATION OF THE REASONING PROCESSES.

The supreme aim of the Science of Logic is to supply "norms," or regulative principles, by which we may reason correctly. This it does in part by insisting on our having perfectly clear concepts and judgments, as already explained. In addition to this it requires us to look critically at the *relations of our propositions*, so as

[1] The effect of practice in improving the reasoning powers in special directions is well illustrated by Locke, *Of the Conduct of the Understanding*, sect. 6, pp. 20, 21.

to see whether our evidence is sufficient to justify our conclusion.

Control of Inductive Reasoning. With respect to the processes of inductive reasoning this regulation becomes a somewhat complicated and difficult matter. It must suffice here to say that we move in the direction of the logical ideal when we take pains to examine a sufficient number of cases, and avoid "hasty generalisation" from one or two facts; when we carefully analyse our facts, adding, when possible, active experiment to observation so as to discover what are the *essential conditions* on which the presence of a phenomenon depends, and what are mere accidental accompaniments of these. Thus in order to reason rightly and scientifically about the causes of combustion, we compare numerous instances, such as the burning of coal in the grate, the gas flame, etc., and by analysing these and eliminating what is accidental arrive at the common circumstance, the presence of certain combustible substances, more particularly carbon, and of oxygen, with which these tend to combine. By placing a piece of carbon in oxygen we afterwards show *experimentally* that these are the essential conditions of the result.[1]

Control of Deduction. The processes of deductive reasoning, though in general much simpler and easier to carry out than those of inductive reasoning, may be imperfectly accomplished and lead to an erroneous or invalid conclusion. Hence the need of logical principles to guide us. These are easily understood, and are capable

[1] The proper methods of Induction as regulated by Logic are briefly set forth by Jevons, *Elementary Lessons in Logic*, xxvii. and following chapters.

of being studied long before the principles of induction can be mastered.

Without going into the technical details of logical science it may be pointed out that since the process of reasoning is essentially a detection of similarity, the great source of erroneous reasoning is *the confusion of things which are not really and fundamentally similar*; in other words, a want of discrimination. The bad reasoner from general principles is one who cannot see where similarity ends and difference begins. A large part of the common errors in deductive argument arise from *ambiguity of terms.* When a person fails to distinguish between different shades of idea attaching to the same word, he is exceedingly liable to go astray in his reasonings. Thus, if it were argued that since all knowledge is the result of *self*-education, children would be much better for being left to educate themselves, the reasoner might be convicted of confusing two meanings of the term self-education, *viz.*, that of an exceptionally gifted youth like Pope, who may be able to take his education into his own hands, and that which ordinary children can and may be expected to carry out *under the stimulation and guidance of others.*

LOGICAL UNIFICATION OF KNOWLEDGE: SCIENCE. The final outcome of the processes of reasoning when logically reduced to a systematic form is what we call an "organic body of knowledge," or a "science". Here we have a mass of facts belonging to the same order, and a number of general truths relating to these, all clearly and methodically set forth in their proper connections. This is illustrated even in those systematised branches of knowledge which are rather descriptive and classificatory than ex-

planatory. Geography, physical and political alike, is a well-arranged system in which facts are dealt with by means of preliminary definitions of concepts, and in which connections of cause and effect are exhibited. It is, however, in the Natural Sciences, as they are called, that we can best see the outcome of such logical organisation and arrangement. Here the ideal procedure is the supplementing of an inductive establishment of principles by a deductive explanation of facts (as well as generalisations of a lower order) by means of these principles.

This arrangement at its best discloses to view the internal relations of the several parts of knowledge. Each concrete fact is brought under its proper class; each single occurrence under its proper "law". Principles are exhibited as inductively reached from observation of concrete facts, and reciprocally as illustrated by, and as supplying an explanation of, these facts. Every part of a science is not only logically consistent with every other part, but the several parts are co-ordinated as closely as possible one with another, by help of the highest and most comprehensive generalities.

Science is the type of logical or "objective" certainty. By this I mean that what is truly scientific, thought out by the rigorous methods of science, is objectively true, and can so clearly exhibit this objective truth as to command the assent of every intelligent mind. It is the perfected form of knowledge from which everything in the shape of individual caprice and of bias or prejudice has been eliminated.

Reaction of Systems of Knowledge on Apprehension. As implied in what was said above on the

work of thought in developing explicit apprehensions of sensible objects (see p. 197 ff.), the formation of clear thoughts reacts on the apprehension of concrete things. This applies not only to the apprehension of things directly by way of the senses, but to that of things indirectly through the assimilation of what others tell us. This clearer mental grasp of the particular, by the aid of general concepts and judgments, is one aspect of what is called Apperception. Such reaction of thought on the perception of the concrete is illustrated when a person versed in fossils recognises that this particular fossil, which you have just shown him, is of such a kind and has been found in such a stratum.

When knowledge becomes systematised in the way required by Logic, this enlightened grasp of the new by help of pre-existing thought-products, becomes a complex process. Thus a classical scholar whose mind has a well-ordered store of knowledge mentally "places" any new Latin work which comes under his notice in *a system of knowledge.* That is to say, he classifies it as a work of a particular Latin author, belonging to a particular period and a particular school. In so doing he *assimilates* the new to the old. At the same time, however, he more or less explicitly apprehends the relations of difference involved in his classification of Latin authors, *viz.*, those between the works of one period and other periods, of this particular writer and contemporary Latin authors, and so on. And, lastly, while he thus assimilates and differentiates he establishes connections of time, etc.; for example, he will know that the particular work was written in such and such a condition of the empire. This has been called the assimilation of

a new fact by way of an Apperceptive System.[1] *The systematised knowledge of science enables us to grasp, assimilate, and place our new observations in the most methodical and perfect way.*

EDUCATIONAL CONTROL OF THOUGHT.

TRAINING CHILDREN IN METHODICAL THINKING: (*a*) EXERCISES IN JUDGING ABOUT THINGS. The highest aim in intellectual education is to develop readiness and precision in carrying out the processes of thought. The value of a person's education can be best tested by his ability to judge and to reason about things.

Exercises in judging begin in close connection with those in the observation, comparison and classification of objects. A child should be encouraged, after observing and comparing the size and shape of objects, their situations and so forth, to express the results of his mental work in suitable and precise language. In this way he will be best trained in thinking out into definite articulate form the relations of things which his surroundings present to him.[2]

Another simple exercise of judgment connects itself with the use of memory. Children should be questioned as to what they have observed in the past, and what they have learned from others, so that clear ideas of the relations of things may be permanently retained in the definite form of propositions.

In these exercises in clear thought the educator should keep his eye on those tendencies which lead children

[1] See G. F. Stout, *Analytic Psychology*, vol. ii., chap. viii.
[2] See Miss Edgeworth, *Practical Education*, iii., p. 196.

to distort the real relations of things under the influence of preconception, and especially of the bias introduced by feeling, *e.g.*, fear, or a strong wish for something. As a great authority, Professor Faraday, tells us: "That part of self-education which consists in teaching the mind to resist its desires and inclinations, until they are proved to be right, is the most important of all".

Throughout these exercises a good deal of attention will need to be paid by the instructor to *a nicely accurate use of words.* The resort to big, grand-sounding words is a common childish tendency closely connected with the impulse to exaggerate and to produce a strong effect. In all serious instruction children should be exercised by means of a little cross-questioning or otherwise in thinking well about the words they choose, so that they may see all that is implied in them, as well as all that is contradicted by them.

Perhaps the hardest problem which arises in training the judgment is that of hitting the happy mean between demanding too much in the way of submission to authority and allowing too much liberty to individual opinion. This problem presses more and more on the teacher as his pupil grows in intelligence.

One point is clear here: since we want to develop the capability of thinking, that is, thinking for oneself and not merely adopting others' thought-products, *we should in all our instruction as far as possible encourage children to grasp and realise the truth of what we tell them by help of their own experience-material and their own processes of thought.* This rule applies obviously to instruction about natural objects which children can themselves examine, as well as to the

simpler kind of instruction about the facts of human life and conduct.

It is obvious, however, that with respect to certain matters the child's liberty of judging must be curtailed. It would not do, for example, to allow him to question the facts of history, though it might be exceedingly desirable even here to meet the exhibition of a sceptical temper of mind not by a mere dogmatic statement, "It is 'written,'" but by unfolding something of the hard painstaking line of study by which men have satisfied themselves about the truth of historical propositions. Nor would it be well to permit children with limited experience to decide what is possible or wise in the way of human action in situations of great complexity; still less to permit them to pronounce on the rightness or wrongness of such complex actions. To reconcile the claims of authority and of individuality in this matter of judging requires much wisdom and skill in the trainer of the young. Differences of temperament and disposition in children require to be taken account of here, *e.g.*, that between the sluggish-minded and timid child, wanting in self-reliance, and disposed to rely on others to excess, and the quick-witted and over-confident child, rather hasty in forming his own opinions.

As experience widens and intelligence develops, greater scope should be given to the child for judging independently about things. He should be carefully led on, little by little, to make use of his individual powers in thinking and deciding for himself. For example, he may be encouraged in certain cases to think out what is suitable and beneficial for himself, and what lines of action it is best for him to pursue. And while judgment is

thus developing on its practical side it should be allowed to exercise itself more freely on the æsthetic side with respect to what is beautiful in natural objects, as well as in art, including literature, also on the logical or scientific side with respect to what is true or probable. A fuller exercise of the individual judgment about ethical matters belongs to a distinctly later period, and presupposes mature experience and reflective power.

(*b*) Exercises in Reasoning. The work of training the young in careful processes of reasoning is closely connected with, and indeed grows out of, the development of their power of judgment. In the earliest stage (from about the beginning of the fourth year) the mother is called on to satisfy the child's curiosity about facts and the reasons of facts. This period is an important and indeed a critical one for the subsequent development of the child. Parents are apt to think that children habitually put questions in a half-mechanical way, without any real desire for an explanation, and even for the sake of teasing. This view, however, as we shall see later on, is far from being accurate.[1] It seems a good rule to give an explanation wherever the nature of the subject allows of a simple and intelligible one.

In thus answering children's questions the educator must of course be careful not to indulge them in habits of intellectual indolence and in a weak dependence on others. They should be stimulated to find out for themselves, as far as may be, the reasons of things. "A word or two (writes Madame Necker) in order to put him on the track, often in order to get him to see that by think-

[1] For illustrations of children's questions see my *Studies of Childhood* ("The Questioning Age"), p. 75 ff.

ing well about the matter he might have been able to answer his own query, these words, I say, will be seeds which will fructify with time."

Very different views have been taken of the desirability of answering children's questions and of reasoning with them. Locke was for encouraging a child's inquisitiveness (*Thoughts*, § 122) and for offering suitable reasons (*ibid.*, § 81). Rousseau, who held that children up to the age of twelve are not rational beings, was of course opposed to this. George Eliot wisely cautions us against reasoning *too much* with a child. By so doing, she says, "you make him a monster without reverence, without affections".

The training of the reasoning powers includes, however, much more than the answering of the spontaneous questionings of children. The little learners must be questioned in their turn as to the reasons of things. The educational value of a well-chosen question of this kind is that it enlarges a child's intellectual horizon, suggests a new possibility of knowledge, a new fact or explanation of fact, and so stimulates his powers of thought. The parent and teacher alike should aim at fixing in a child's mind a habit of inquiry by repeatedly directing his attention to what is happening around him, and encouraging him to find out how these events are brought about. Here, of course, great discernment needs to be shown in selecting problems which the child's previous knowledge will enable him to grapple with. This exercise of the young mind in discovering the reasons of things involves a training in orderly recollection; in stimulating him to go back to past experiences in search of fruitful analogies, as well as to principles already acquired in search of explanations.[1]

[1] On the nature of explanation, the reader should consult Jevons, *Elementary Lessons in Logic*, xxxi. Compare Lloyd Morgan's *Psychology for Teachers*, chap. vi.

The systematic training of the reasoning powers has for its chief aim the avoiding of the errors incident to the processes of induction and deduction. Children need to be warned against "hasty generalisations" respecting the causes of things, to be led by a more methodical comparison of instances and analysis of these to distinguish essential conditions from mere accompaniments. In like manner the teacher needs from time to time to direct the young reasoner in drawing conclusions from principles, by leading him to see the limits of a rule, and to distinguish the cases that properly fall under it from those which do not; and, further, by familiarising him with the dangers that lurk in ambiguous language. It is now well known that children are very apt to reason by way of word-analogies, as when they suppose that "butterflies" must make "butter". These tendencies, which are especially strong in imaginative children, have carefully to be watched by the teacher. In this more systematic training in reasoning some knowledge of logical principles will be found indispensable to the teacher.

Science and Training of the Reasoning Powers. It follows from what has been said that there is no subject of study dealing in a connected and methodical way with a group of facts which may not in the hands of an intelligent and efficient teacher be made an instrument for developing a child's reasoning powers. Thus the study of physical geography should be made the occasion for exercising the child not only in forming clear scientific concepts, but also in reasoning as to the causes of natural phenomena. History, again, when well taught, may be made to exercise the learner in

tracing analogies, in discovering the causes and the effects of human action, and in bringing particular occurrences under simple principles. It is further one of the best fields for exercising older pupils in a careful estimation of the comparative value of conflicting evidence.

It is, however, the more highly generalised body of knowledge—to which we commonly confine the name Science—that supplies the most effective means of systematic training. In science we have knowledge carried to the highest point of generality and precision. It is, further, an *orderly arrangement* of knowledge in a unified system, in which facts and principles are set forth in their right relations, and in which the mind is carried on in a methodical way from fact to law, and from principle to concrete illustration.

While all sciences, properly so called, are thus fitted to train the mind in an orderly arrangement of knowledge they have different educational uses; some exhibiting more of the inductive process, others more of the deductive. The physical sciences (so far as they are not treated mathematically) are largely classificatory and inductive. That is to say, the reasoning processes involved consist in the main of careful observation and analysis of facts, experiment and the establishment of laws of connection between facts. Such sciences as botany and chemistry provide the best training in the patient and accurate investigation of facts, in methodical classification, and in the building up of general truths on a firm basis of actual observation. On the other hand, the mathematical sciences are almost entirely deductive. Here the principles, being simple and self-evident, are stated at the outset in the shape of axioms, etc.; and the de-

velopment of the science proceeds by an orderly unfolding of the consequences of these principles, the results of each of these deductive processes being made use of as starting-points in later processes. The exactness of the initial conceptions, such as "line," "equality," and so forth, and the absence of all ambiguity of language, render such mathematic deduction the type of exact "demonstration"; and its educational value lies in the fact that it trains the learner in making his ideas as definite as possible, in separating out simple elementary truths as starting-points, and in insisting on necessity of logical sequence in passing from premise to conclusion. Mathematics has commonly been held up as the best instrument for disciplining the mind in exactness and consistency of thought.

ORDER OF INSTRUCTION. Our psychological examination of the way in which a child's mind advances suggests that in developing a systematic knowledge the teacher has to proceed in a certain order. It is now coming to be recognised that in the early stages of intellectual development it is impossible to deal with the whole field of knowledge in a systematic way. As has been shown, a subject like history has to be taught under the form of selected concrete "stories" before it can be studied in a connected way. In like manner the first exercises of thought must set out from the concrete, and aim at reaching the abstract by way of this. That is to say, the teacher has to proceed according to what is known as the "inductive method," *i.e.*, leading the pupil up from an inspection of examples or instances to a comprehension of the general class and of the laws which are valid for all members of the class. In this

way the teacher moves from particular examples of natural substances, of plants and animals, of geometric figures, of words presented to the child's senses, and so forth, up to the corresponding classes and the universal truths relating to their properties and uses. In no cases ought principles to be introduced before *some* examples are given. Even in teaching arithmetic it is now seen that the elementary principles, *i.e.*, the simpler truths of number, are best taught by means of a kind of inductive process carried out on concrete examples. Not only so, even such "self-evident" truths as the axioms of geometry require, as mathematical teachers are well aware, a certain amount of concrete illustration. The words of Seneca in reference to practical training apply to theoretic instruction also:—

> "Longum iter est per præcepta :
> Breve et efficax per exempla ".

Thus, in every case, the right method of teaching a subject proceeds to some extent according to what has been called the Order of Discovery, the order to which the human race, under the circumstances, was necessarily shut up in finding out these truths.[1]

But a little reflection tells us that this reference to the natural order of development of the individual's mind and of the mind of the race is not sufficient here. The teacher, by reason of the fact that he possesses (or at least is supposed to possess) the fuller knowledge gained by the race, interferes with nature's spontaneous order. In his so-called "inductive teaching" he does

[1] The reader should compare what was said above on the parallelism between the evolution of the individual and of the race (chap. vi., pp. 63, 64).

not, it is evident, need to go through all the slow laborious processes by which the race found its way to this knowledge. *The teacher is there to put the learner on the direct road to knowledge, which otherwise he might never hit at all, and he only needs to present a sufficient number of concrete examples to enable his pupil to understand and assimilate the principle.*

Nor is this all. As the child's intellectual powers develop, and more difficult thinking processes become possible, another principle comes more and more into operation. The *psychological* principle, "adapt your materials to the growing powers of the child's mind," is now supplemented by a *logical* principle, "so present facts and truths as best *to set forth clearly and intelligibly their inherent connections*". In other words, the teacher has to take the unified body of knowledge called a science and unfold its several parts in a thoroughly scientific way, which is also the most economical way for grasping the whole. Hence, in teaching such a subject as geometry or grammar, he will reduce the preliminary analysis to a minimum, carrying the learner's mind on as quickly as possible to a grasp of the elementary ideas and truths, so as to be able to proceed "synthetically" or deductively by following out the consequences of these and of their several combinations.

A like intrusion of the logical principle of an orderly and connected presentation of teaching-material shows itself with respect to *the selection of the different subjects of the curriculum* and of their chronological arrangement. At first this is largely determined by the capacities of the learner's mind. That is to say, subjects are selected, such as the simpler aspects of nature-

lore, the narrative treatment of history and so forth, which especially appeal to the powers of observation, memory and imagination. As the years advance, and a more systematic assimilation of knowledge becomes possible, the logical connections between different branches of knowledge have more and more to be considered, and the pupil taken methodically from those which are simplest and most independent to those which are relatively complex and presuppose the former, as is illustrated in the order, (1) mathematics, (2) physics, (3) chemistry, and (4) biology.

It is to be added that the introduction of the logical principle is the supreme illustration of the educational maxim: "From the simple to the complex". The elementary conceptions of geometry, for example, are the truly simple part of the science. When, in the earlier stages of education, we are considering mainly the state of the learner's mind we cannot give full effect to this maxim. The concrete objects which are set before our eyes are in truth very complex, and only get simplified by analysis and classification. At this stage the teacher has to steer his course rather by way of the other maxims: "From the known to the unknown," and "From the concrete to the abstract".

It is apt to be supposed that these maxims are of similar import if not interchangeable; but this is not so. "From the simple to the complex" is so far a psychological principle in that it bids us in all our training, *e.g.*, in observation or imaginative construction, to begin with simple presentations and ideas, rather than with complex ones. But it is also, and in an important measure, a logical principle. In a systematic study of a science the student sets out with conceptions which are highly abstract and remote from the familiar facts of his everyday surroundings, such as "circle," the fraction "½," "a smooth plane," "organ," "government". Yet these same conceptions are

essentially simple in their logical character, inasmuch as the process of abstraction is a simplification of the complex facts of our experience. The percept of this round plate with its colour, its pattern, its weight, etc., is analysed and simplified when we regard it as a circle, and similarly with other concrete presentations. The simplicity of these elementary notions is further illustrated in the fact that they can be applied by way of explanation to a large variety of complex sense-presentations.[1]

REFERENCES FOR READING.

For a fuller account of the processes of Thought the student may consult the following: Sully, *The Human Mind*, chap. xii.; W. James, *Psychology*, chap. xxii.; and J. Ward, article "Psychology" in the *Encyclopædia Britannica*, p. 77 ff.

The early developments of these processes are dealt with by Sully, *Studies of Childhood*, chaps. iii. and iv.; B. Perez, *First Three Years of Childhood*, chap. x., also in his later work, *L'Education intellectuelle*, chaps. vii. and viii.; and G. Compayré, *L'Evolution intellectuelle et morale de l'enfant*, chap. x.

On training children in the processes of judging and reasoning the student may with advantage consult the following: Locke, *Conduct of the Understanding* (edited by Prof. T. Fowler); Maria Edgeworth, *Practical Education*, chap. xxiii.; S. S. Laurie, *Institutes of Education*, part ii., lectures vii.-x.; G. Compayré, *Psychology applied to Education*, chap. vi. and following; E. Rayot, *Leçons de Psychologie*, leçon xiii.

On the question of the proper mode of progress in intellectual education, the following may be consulted: H. Spencer, *Education*, chap. ii.; A. Bain, *Education as a Science*, chaps. vi. and vii.; W. H. Payne, *Contributions to the Science of Education*, chaps. iv.-vi. and ix.; Felkin's *Introduction to Herbart's Education*, chap. iii., section 2. The reader of German may compare Waitz, *Allgem. Pädagogik*, § 22, and the article "Formal-Stufen" in Rein's *Encyclop. Handbuch der Pädagogik*.

In connection with this part of intellectual training the teacher is strongly recommended to study the elements of logic, both deductive and inductive, as expounded in Jevons' *Elementary Lessons*, W. Minto's *Logic, Deductive and Inductive*, or similar text-book.

[1] There are some good criticisms of current explanations of these maxims in W. H. Payne's *Contributions to the Science of Education*, iv.-vi. and ix. The reader of German may compare Ziller, *Allgem. Pädagogik*, pp. 259, 262.

PART III.

THE DEVELOPMENT OF FEELING.

CHAPTER XVI.

GENERAL CHARACTERISTICS OF FEELING.

HAVING now briefly reviewed the growth of intellectual activity, we may pass on to trace the second phase of mental development, the gradual emergence and growing complication of the affective function, or of the feeling aspect of our mental states (compare above, chap. iv., pp. 45, 46).

FEELING DEFINED. As we have seen, the term feeling marks off the pleasure-and-pain "tone" or aspect of our experience. Such feeling-tone may be immediately connected with a sensation, for example, that of hunger or a sweet odour, or may accompany some higher form of mental activity, such as the emotion of admiration or hope. While all feeling has the characteristic of being agreeable or disagreeable in some degree, there are many feeling-tones which are of a mixed character, such as that of the sensation induced by scratching an inflamed portion of the skin, or of the emotion of grief at the loss of a friend. Feeling-tones exhibit all degrees of intensity, from the quiet current of agreeable satisfaction

which attends the consciousness of doing right, up to the violent excitement of a transporting joy.

As already suggested, we are wont to speak of those mental states which have a marked preponderance of feeling-tone as "feelings". In this way we describe hunger and thirst, and the emotions of love and grief. In so doing we must not forget that the states so described are really complex, having a presentative and even a conative, as well as an affective or feeling element.

Although only erected into a leading function of mind within the last century, feeling constitutes a well-marked phase of the "stream" of our conscious life. Our pleasures and pains make up the *interesting* side of our experience. The objects of the external world only acquire a value for us in so far as they touch our feelings. Since, moreover, the feeling-tone of our experience determines its character as happy or the opposite the clear understanding of its conditions forms an important part of the science of well-being.

But feeling is not merely a subject of great importance in itself: it stands, as we have seen, in close and vital connection with the other two sides of mind. On the one side, it is essentially involved in the exercise and development of the intellect. Although, when it rises to the violent intensity of excitement, it opposes itself to intellectual activity, it supplies in its more moderate degrees the element of vital interest which rouses the faculties to strenuous activity. The *culture of intelligence is accordingly at every stage limited by the development of the feelings.* On the other hand, the cultivation of the intellect reacts upon the growth of all

the higher and more refined feelings, such as the sense of beauty.

On the other side, feeling stands in intimate connection with conscious action and volition. When we are strongly affected by pleasure or pain the feeling manifests itself directly in the active form of movement. Not only so, it is feeling which, as we shall see, contributes the dynamic or propulsive element in voluntary action. The motives which urge us to do things are products of feeling. Thus we say that a man acts from the *fear* of bodily want, the *love* of family or country, and so forth. The *habitual directions of a person's conduct follow the lead of his dominant feelings* (compare above, p. 51).

Some Effects of Feeling. Every mental state which has a strongly marked feeling-tone, whether agreeable or disagreeable, shows a tendency to persist and to master all the mental processes. The more violent feelings have, when not interfered with, a gradual rise and subsidence, the stages of which we can easily trace. A child carried away by hilarious excitement or by angry passion illustrates this course of gradual rise and fall. When the current of feeling is thus allowed to attain to its full volume, as in all forms of passionate excitement, well-marked effects, both mental and bodily, are observable.

(1) To begin with, great intensity of feeling is apt to disturb the normal flow of ideas. This is due to the fact that the feeling-element itself becomes a powerful *suggestive force*. A child in a fit of anger is apt to imagine this and that injury: the angry condition favours the emergence of ideas of injury. Not only so, violent feeling of any kind weakens and may even

paralyse for the moment the action of the will in selective attention. Hence the inability of children when violently excited, as by hope of some great pleasure, or by dread, to judge and otherwise think clearly.

(2) Along with these mental disturbances, feeling produces important bodily results. The close connection between mind and body is nowhere more plainly illustrated than in these physical effects. A sudden joy, an access of anger, radiates, so to speak, over the organism, bringing about marked changes in the vital processes, such as the action of the heart, the respiration, the circulation and so forth, and commonly exciting the voluntary muscles to activity. Among these effects on the voluntary muscles must be included the *expressive movements* by which an emotion, say of joy or grief, is manifested to others. These will be spoken of more fully in connection with the discussion of the emotions.

General Conditions of Pleasure and Pain. We may now pass to a fuller consideration of each of these contrasting feeling-tones, which are commonly spoken of as pleasure and pain, but which, when more comprehensively viewed, may be defined as agreeable and disagreeable consciousness. Each of them has its specific conditions, the knowledge of which is of great importance, both by way of securing the happiness of the young, and of working on their active impulses.

It is commonly held that pleasure or agreeable consciousness is brought about by the moderate and suitable activity of any organ—including the cerebral organs which are engaged in the intellectual processes—the action of which affects our consciousness. A moderate stimulation of the eye by light, or of the muscular system

by bodily exercise, as well as a moderate activity of the observing or reasoning powers, is distinctly agreeable.

If, however, the activity passes a certain limit, the agreeable effect diminishes and rapidly passes into a distinctly disagreeable one. Thus when the light of the rising sun exceeds a certain intensity, the eye is fatigued or "blinded"; similarly, violent or unduly prolonged muscular exercise, or an excessive strain of the mental powers, is fatiguing and as such disagreeable.

The disagreeable side of feeling may, however, be induced in other ways. The *want* of an appropriate stimulus, when it affects consciousness at all, gives rise to a distinctly disagreeable mental state, that of restlessness and *craving*. Examples of this are to be found in the uneasiness of an active boy who is shut in during the play-hour and cannot indulge in muscular activity, and in the mental condition, known as tedium or *ennui*, which is induced by the absence of wholesome mental occupation. Disagreeable feeling is further caused by anything which *obstructs* our activity, as when we try to push a door open and find an obstacle in the way. To this variety are closely related the pains which come by way of *injury*, whether to our body or to some interest which we value, such as our property or our reputation.

It is commonly held that the moderate activity of an organ is beneficial to that organ, furthering its future efficiency, whereas excessive activity tends to injure the organ and to impair its future efficiency. It is probable, further, that impeded functioning is also injurious to the organ or organs concerned, and this is certainly true of injuries to organs. We may say then that *pain has for*

its essential condition some lowering of conscious functional activity, whether by way of an excessive and so exhausting mode of activity, of a defective exercise of function, or, lastly, of injury to an organ; and that pleasure has for its underlying condition a heightening of conscious functional activity by way of normal and suitable exercise.

So far we have spoken of the action of single organs. But since the several organs of the body stand in the closest connection one with another, the state of any one must necessarily react upon that of the others. Thus a healthy and vigorous condition of the brain acts beneficially on the other organs, and *vice versâ. In this way all pleasurable states, when not carried to the point of violent and exhausting excitement, have an exhilarating effect on the whole organism, and raise the sense of conscious life, whereas painful states have a depressing and lowering effect on the organism as a whole, and lower the sense of conscious life.*

Monotony and Change. After setting forth the main principle or law of our pleasurable and painful experiences, we may pass to one or two subordinate principles.

To begin with, the affective tone of our mental states is subject to the law of Change or Contrast already referred to (see above, p. 146). Any source of pleasurable feeling, if it remain wholly unchanged, tends to lose its first effect. For example, bodily exercise is apt to lose, after an hour or less, its first delightful accompaniment of freshness. On the other hand, change in the mode of activity is a known cause of enjoyment. *Variatio delectat.* The transition from the schoolroom to the

playground, and back again from play to school-work, is, or may become, exhilarating. The peculiar delightfulness of all novel experience, such as the first walking tour, is only a more striking illustration of the same principle.

A like result shows itself in the case of prolonged pains, provided they are of moderate intensity. We suffer less from lasting physical discomforts and from worries and troubles when we "get used" to them. What is known by schoolmasters as the "hardening" process illustrates this principle. A boy is inured to the hard bed, the cold early wash, and so forth, when he gets so accustomed to these things as not to mind them. What we call the deadening of the finer sensibilities illustrates the same law. A child's sense of shame is frequently dulled by repeated acts of brutality, such as humiliating words, and holding up to public ridicule.[1] Such repetition robs the painful sense of hurt of its first sharpness. Horror at the sight of brutality, and even the dread of death, may similarly be blunted by familiarity. As Hamlet says, apropos of the grave-digger who sings over his work: "The hand of little employment hath the daintier sense".

ACCOMMODATION TO SURROUNDINGS. This diminution in the intensity of pleasure and of pain, due to prolonged action of the cause, evidently implies a change in the condition of the organ concerned. There is here an adjustment or accommodation of the organism to its surroundings.

A striking example of this process of self-adjustment is seen in the fact that a stimulus which at first is

[1] The reason why this effect is not universal will be explained presently.

distinctly disagreeable may in time become not only indifferent but positively pleasurable. This is illustrated in the acquired likings of the palate, the fondness for alcoholic drinks, bitter condiments, and so on. Another illustration is seen in the well-known effects of a persistent exercise of an organ. The growth that results from a regular periodic exercise of muscle or brain, implies an accommodation of the organ to a greater strength of stimulus, so that an amount of exercise which was at first excessive and painful becomes enjoyable.

One other effect of the prolongation or the frequent renewal of stimulation remains to be touched on. *What is customary, though it loses the first fresh charm, becomes endeared by Habit, so that when deprived of it we suffer.* It is owing to this principle that a child's mind and body get set in certain definite lines of activity. He finds a quiet satisfaction in going through the round of occupations, such as the meals, the walk, and lessons to which he has grown accustomed, and will even resent any interruption of the customary order.

The craving for change and the clinging to what is customary are two opposed principles of the affective side of our experience. A certain amount of variety and novelty is necessary to prolonged enjoyment. Yet if the change from the old to the new is abrupt and involves a rupture of the habitual there arises the painful sense of loss. This principle has, as we shall see presently, important bearings on the affective life of children.

VARIETIES OF AFFECTIVE STATE: CLASSIFICATION OF FEELINGS.

As I have pointed out, mental states with strongly marked and preponderant feeling-tone are commonly described as "feelings". We have now to consider the concrete varieties of affective experience thus arising and the proper mode of classifying these.

The first and most obvious distinction is that drawn in everyday thought between "bodily" feelings, *i.e.*, the affective changes concomitant with sensation, such as the pleasure and pain aspect of thirst and its satisfaction, or of a sweet perfume, and "mental" feelings, *i.e.*, the affective phenomena which have as their condition some higher mode of conscious activity, such as the pleasures of hope, the pains of regret. The first, which are often in popular language described as "sensations," are properly named Sense-feelings. They are comparatively simple phenomena. The second are best distinguished as Emotions, and, as we shall presently see, are complex mental states.

(A) SENSE-FEELINGS. These, again, fall into two distinct groups: (*a*) The first arises out of changing functional conditions of the bodily, and more particularly the vital, organs, such as the agreeable and disagreeable feeling accompanying bodily warmth and chill, or full unimpeded and impeded respiration. They are known as the Organic sense-feelings. (*b*) The second group arises from the changing activity of the organs of special sense and the muscles, such as the agreeable and disagreeable accompaniments of touching soft and smooth, and hard and rough objects. These may be called the Feelings of Special Sense.

The first group plays a large part in the life of feeling, especially in early life. States of physical comfort and discomfort form the basis of what we call *tone of mind*, whether as cheerful and lively, or as gloomy and depressed.

The pleasures and pains connected with the activity of the special senses are of a higher order than those arising from bodily changes. In general they have the pleasurable aspect best marked, whereas the lower feelings, connected with the bodily processes, are rather of a painful than of a pleasurable character. They presuppose as their condition the developed activity of the senses, which, as we have seen, includes some power of focussing attention on sense-presentations, and on the other hand of employing the muscular organs. Hence they only become clearly marked after the first months of life. The delight in rhythmic movement, in colour, in sweet sound, and so forth, though we may see a germ of it in animal life, marks the growth of the distinctly human functions.

(B) THE EMOTIONS. From the sense-feelings must be carefully distinguished those more complex mental states which are known as emotions, such as the state of anger, fear, love.

An emotion, as already pointed out, takes its rise in some intellectual state, whether the perception of an object, say a dangerous enemy or a beautiful plant, or on the other hand the idea or mental representation of such an object. Hence, although certain emotions common to man and some of the lower animals are in a sense congenitally determined or "instinctive," [1] the full

[1] On the use of the words "instinct," "instinctive," in Psychology, see above, p. 64, footnote.

development of emotional states involves that of the intellectual life.

If we analyse any emotional state we find it composite. Take the case of an angry child who thinks that he has been injured. Here the idea of some injury done to him is the starting-point and the sustaining force. This "sense" of injury has a well-marked painful tone, and this gives the dominant character to the whole state. The complete emotional state, however, involves much more than this. Anger, when fully developed, takes possession of the whole body. The vital processes, more especially those of respiration and circulation, are profoundly modified. Not only so, the voluntary muscles are called into action, the child shrieks, stamps on the floor, and strikes or throws things about. The several sensations which accompany these bodily changes stand in the closest connection with the painful consciousness of being injured, and give to the whole state of anger its characteristic complexion. It has been well said that the state of fear divested of the escort of sensations arising from the accompanying organic changes, such as tremor, chilliness, and disturbed heart-action, would no longer be what we mean by "fear".

It only remains to add that this discharge of nervous force from the brain-centres on to the muscular system as well as the vital organs contains a *conative* element. The shrieking and striking of an angry child, the shrinking back and running away of a fearsome child, are of the nature of instinctive actions, and are readily developed into true purposeful acts.

This slight analysis of an emotional state may suffice to show that it is a great disturbing factor in the flow of

27

our mental life. When fully developed into a state of passionate agitation, emotion tyrannises over the mind and body alike. Each passes out of control, it being as impossible to keep the body still as to preserve a calm condition of the mind.

Development of Emotion. The same general laws of mental development which we have found to hold good in the case of the intellectual faculties apply, allowing for certain differences, to the emotions also. The instinctive or congenital tendencies underlying such emotions as fear and anger are fixed and deepened by repeated exercise or indulgence; or to express it otherwise, our emotional states develop in point of depth and complexity as experience advances. Compare, for example, the love of home, or of parents, of a child and of an adult. Not only so, we may note an order of development of the several varieties of emotional state, from those which are comparatively simple in their composition, involving little mental representation, to these which are complex in their nature, implying a high degree of representative activity. This may be illustrated by comparing an early and largely instinctive emotion, such as fear of a bodily hurt, with a late-developed emotion, such as the moral sentiment.

(1) *Congenital Element.* Our emotions spring out of certain impulses which are instinctive or unacquired, being determined by the congenital formation of the organs of the nervous system. The child is so constituted as to *react* in the particular way indicated by the term "anger" or "fear" when the appropriate circumstances and experiences, *viz.*, the apprehension of injury or of danger, present themselves. And this in-

stinctive rudiment of emotion is not the same in all cases. We find that similar circumstances and experiences do not call forth the same strength or violence of reaction, or produce the same intensity of emotion, in all children alike. The sum of these congenital dispositions constitutes the child's *emotional nature* or *temperament.*

It is a further question whether the instinctive foundations of emotion include more specialised tendencies. It has been thought by some that when an infant shows fear of certain animals, *e.g.*, the dog, this may be the result of a kind of *inherited association*, that is to say, the product of the experience of the child's ancestors transmitted by heredity. But this view is not adopted by all psychologists.

(2) *The Effect of Exercise and Experience.* While, however, our emotional life has its roots in certain instinctive reactions, its developed form presupposes a certain amount and variety of individual experience.

The affective side of our experience, its pleasurable and painful aspect, is subject to the general law of functional activity, that of developmental modification by repeated exercise. Just as every new exercise, say, of attention, modifies the central nervous organs in some way so as to help to fix the disposition to attend and to perfect the act, so every indulgence or discharge of an emotional reaction tends to fix or strengthen the corresponding disposition. The child that is allowed to give way to outbursts of angry passion tends to become more disposed to anger, more ready to react on slight provocation.

Not only so, the action of growing experience tends to deepen and complicate the several emotional states. A child that has been injured again and again by another

comes to cherish a deeper and more lasting feeling of *hatred.* Similarly with fear, love and the other emotions. This implies a *cumulative effect*, *viz.*, that of earlier experiences in modifying and deepening later experiences of a like kind; and this again involves the fundamental property of retentiveness.

REVIVAL AND ASSOCIATION OF FEELING. One part of this deepening and complicating of emotional states requires special notice. Our affective experiences are capable of being revived. I can recall a fear and imagine myself as afraid again, and in certain circumstances this revival is very full and vivid, and approximates to the real experience, *e.g.*, when listening to a gruesome story. All such revival illustrates the action of Association. We only recall a feeling of pleasure or of pain by recalling the sense-presentations, of which the feeling was an accompaniment. Thus, to take a simple case, the pleasurable experience of a plunge into cool water is recalled by the sight or vivid imagination of a cool stream on a hot day. Similarly, the emotion of anger is recalled by seeing the person who has injured us, or (less forcibly) by hearing his name mentioned. As is well known, locality is a potent reviver of our affective states. A child is apt to take a violent repugnance to a room where it has undergone some painful experience.

The reader should compare this with what was said in chapter ix. on the effect of feeling in fixing impressions on the mind. When a presentation has a marked feeling-tone this serves to fix the attention, and so to produce a lasting image; conversely, the image thus rendered distinct and permanent serves as the medium for the revival of the feeling.

Owing to this action of association, feeling may become

in a sense *transferred* to new and originally indifferent objects. If an object present itself again and again in circumstances which are highly enjoyable or the reverse, it may come to yield pleasure or displeasure even though we do not recall these circumstances. Thus places and persons may affect us agreeably or disagreeably after we have forgotten the incidents which gave rise to the association. The growth of emotion depends to a considerable extent on the quickness with which such associations are formed, and on the pertinacity of these associations. Children of a lively emotional temperament are quick in investing places, objects, and persons with agreeable and disagreeable associations, and, as a consequence of this, they easily acquire strong likes and dislikes. One wonders what odd association led the little girl, afterwards known as George Sand, to take an invincible dislike to the letter B among all the letters of the alphabet.

The gradual expansion and complication of our emotional states are the effect of the associative processes just described. Thus the growth of a deep liking or fondness for our home, our parents, our favourite books and so forth is due to the integration or unification of a number of agreeable associations which successively attach themselves to one and the same object. The more numerous and varied the agreeable or disagreeable experiences which thus combine in these associations, the greater the volume of the resulting feeling. Mixed emotional states, *e.g.*, that called forth by the sight of a home where a number of pleasurable and painful experiences were undergone, illustrate the same integration of associative elements.

The process of emotional development here briefly described, tends to counteract the dulling effect of Repetition and Habit already referred to. For example, a sensitive boy who is persistently "teased" by his school-fellows may, instead of growing hardened, develop a secret and profound feeling of isolation and degradation. The same applies to changes extending over longer periods. The first delicious enjoyment of flowers, of scenery, or of music, though in a sense it passes, gets taken up into the quieter love of later years. As George Eliot has it, "Our delight in the sunshine on the deep-bladed grass to-day, might be no more than the faint perception of wearied souls, if it were not for the sunshine and the grass in the far-off years which still live in us, and transform our perception into love". To this must be added that the later experiences nearly always add new elements to the feeling, giving it greater range and complexity.

The principle of Habit plays, however, a real and important part in the growth of emotion. It serves to fix it in certain definite channels and to develop *permanent emotional dispositions.* In this way, for example, a child gradually develops a lasting tendency to react in a particular emotional form, such as self-complacency, sympathy, admiration of what is beautiful and noble. Such permanent emotional dispositions are sometimes spoken of as *Affections* or *Passions.*

The most important result of this fixing of emotional reaction in definite lines by Habit is the formation of persistent active *inclinations.* In this way, for example, love, from being a mere reaction of tenderness and passive sympathy, grows into an active impulse to

please and further the happiness of the beloved object. This formation of permanent active inclinations becomes, as we shall see, an important element in the development of will and character.

Order of Development of the Emotions. The various emotions, like the intellectual "faculties," appear to unfold themselves in the order of increasing complexity and representativeness (see p. 67 ff.). For example, the emotion of fear, in its simpler forms of dread of physical injury, is known to be among the earliest. And this emotion is, as we shall see, largely an instinctive reaction, presupposing merely a certain amount of experience of (physical) pain and the power of recalling and representing this. A feeling of affection for a person, on the other hand, comes later than this, because it involves a greater complexity of experience and a higher degree of representative power.

Without attempting the difficult task of classifying the great variety of our emotional states, we may mark off three important classes which answer roughly to three grades of complexity. (1) The first group may be called Instinctive or Animal Emotions. They consist of certain emotions, such as Anger and Fear, which have a large instinctive factor and appear early in children, as also in animals. Since they are closely related to that impulse of self-preservation which is strong in the child as in the lower animals, they may be called also Self-preservative or Egoistic Emotions. Some of these, as, for example, Anger and Envy, being distinctly inimical to our fellows, are sometimes described as Anti-social feelings.

(2) The second group may be marked off as typical Representative Emotions. They include the several

varieties of emotional state which have as a common base what we call Sympathy or Fellow-feeling. It is evident that when we feel for another's grief we are representing his state by help of our own experiences. This group is developed distinctly later than the first. The emotions here included are sometimes marked off as the Social Feelings, and so set in opposition to group (1).

(3) The third group consists of highly complex and representative emotions, which are commonly known as Sentiments, such as patriotism, the feeling for nature, and for humanity. The more important of them may be brought under three heads, the Intellectual Sentiment or the love of Truth, the Æsthetic Sentiment or admiration of the Beautiful, and the Moral Sentiment or reverence for Duty. These emotions in their fully developed form attach themselves to certain ideas of an abstract kind, *viz.*, truth, beauty, moral goodness. Hence they are the Human Emotions in a peculiar sense. Even in the case of man they only attain to a considerable measure of development under the full humanising influences of education.

In glancing at this series we are at once struck by the great and profound differences between the earlier and more instinctive and the later and more reflective emotions. The gradual development of the emotional life by introducing the calmer sentiments serves in itself to diminish the violence of the earlier animal emotions. It is to be noted, further, that the development of the emotional life is a much more complex process than is represented in this scheme. The lower emotions get taken up *and organised into* the more complex wholes which we call sentiments. As recently pointed out, in every " love " or " interest " a number of the earlier emotions are involved.[1] Thus in our love for a person there are fear and its opposite, hope,

[1] See an article by A. F. Shand on " Character and the Emotions " in *Mind*, 1896, p. 218 and following.

resentment of injury, and a certain form of self-love too (in the love of the object *as mine*). The fact that the earlier turbulent feelings may become organised as elements in the later and more refined sentiments is a fact of capital importance in moral education.

EARLY DEVELOPMENT OF FEELING.

CHARACTERISTICS OF CHILDREN'S FEELINGS. The element of feeling has a preponderant place in the early stages of the mental life. In the first months, when intellect is as yet almost dormant and voluntary action has still to be acquired, the affective phase is well marked and pronounced.

This preponderance in early life of pleasure and pain is impressed upon us by the direct and energetic character of the expressive reactions. A little child expresses both misery and joy instinctively, and with as little of restraint as of an affected attempt to show feeling. Hence the ease with which this side of its mental life may be observed.

A child is endowed at birth with sensibilities to pain and to pleasure. For example, it experiences pain when cold or hungry, and pleasure when warm, or when appetite is being sated.

The fact that the earliest experience of pleasure and pain grows out of the changes of the organic life, suggests that the painful element is at first the more distinctly marked. The frequent shriekings of misery are more impressive to a spectator of infancy than the occasional smilings. There is little doubt that during the first years at least, when the physical functions are as yet but imperfectly developed, bodily disturbance is the chief source of the intenser forms of feeling.

About the age of three or four months the Special

sense-feelings become a distinct and a prominent factor. Later on when locomotion is added to arm and hand movement, the fuller experience of muscular activity becomes all-absorbing. This development of the higher sense-feelings tends to bring pleasure up to the level of pain. There is reason to think that during the first years a child finds a luxurious enjoyment in certain sensations of touch, hearing, and sight which is lost in adult life. Harriet Martineau tells us of the exquisite delight which she experienced when about three years old in passing her fingers round a button covered with black velvet on the top of a sister's bonnet.[1] The same is true of the sensations produced by certain colours and tones.

The development of muscular activity, and, along with this, of the exploring or experimental and play impulses, brings the child under the empire of the laws of activity and change. The inexperienced inhabitants of the nursery illustrate at once the joyousness of full normal activity and the misery of a wearing over-activity. They show us, too, no less distinctly, the imperious need of variety, and the suffering which may come in the case of one endowed with vigorous impulses by way of monotony and the closing of channels of activity.

As implied in what has been said above, children very early show true emotional reactions: they express the germ of anger ("temper"), fear and other instinctive emotions certainly within the first year. These first emotional outbursts, however, though a step above the pains and pleasures of sense, are dependent on sense-presentations. Thus, for example, a child can only ex-

[1] *Household Education*, chap. xix.

perience fear when something alarming is before his eyes, he is unable as yet to recall and imagine objects of dread.

This early subjection of feeling to sense-stimuli, *viz.*, sensations and sense-perceptions, may help us to understand other characteristics of children's affective experience. To begin with, what strikes us in their manifestations of pain and pleasure is the swiftness, *the immediacy of the reactions.* Children are excitable in the sense that they are easily moved by external presentations to joy and to grief, to laughter and to tears. This follows from the instinctive simplicity of these effects, and the absence of the controlling interference of ideas. The same characteristic has been observed in savage races.

Another prominent characteristic of this early manifestation of feeling is *its violence and masterfulness.* The outbreaks of childish temper are in their stormy violence and their complete mastery of the mind unlike anything that occurs in later life—at least in the case of those who have learnt to govern their passions. This turbulence of emotion, which produces the most marked effects on the mind and body alike, is clearly explained by the absence of ideas and of reflection. The bodily discomfort is an all-absorbing misery as long as it lasts, because the child is unable to bring memory and reflection to his aid, so as to discern the limits, and the momentary duration, of his suffering. Similarly, the sight of a dog will fill the mind of a timid child with an oppressive dread, just because he is unable to recall former experiences and to comfort himself by reflection. To quote George Eliot again, " Childhood has no forebodings ; but then it is

soothed by no memories of outlived sorrow". It may be added that the child's want of volitional control excludes at this stage the effort to restrain and master the passions.

With this violence of childish feeling there is correlated another characteristic, *viz.*, its *fugitiveness* The passionate child differs from the passionate man in the transitoriness of his outbursts. This is their redeeming aspect. There is something almost amusing in watching the storm of passion suddenly calmed by so small a change in the environment, as some new movement of "kitty," or of a human playmate. This transitoriness of childish grief, again, is only another consequence of the subjection of feeling to sense-stimuli: a child ceases to grieve because he forgets the cause of his misery, and his attention is diverted to new objects of perception and lines of agreeable activity.

The same dependence of childish feeling on the surroundings of the moment may help us to understand another of its characteristics, *viz., its changeableness and capriciousness.* A child has but few fixed likings or antipathies. To-day he is full of caresses for his nurse or his toy-animal; to-morrow his mood changes round to the other pole, and he heaps abuse on his favourite. The annoyance caused at the moment by nurse's unwelcome command is not supplemented and counterbalanced by a remembrance of her many past kindnesses: hence the sudden *volte-face.*

INDIVIDUALITY AND FEELING. While there are these common characteristics in children's feelings there are also considerable diversities in the case of different children. What we call "temperament" implies certain individual peculiarities in the intensity and in the directions of the

life of feeling. We all know the contrast of the happy expansive child, responsive to all pleasurable stimulation from without, and the "peevish child," quick to be hurt rather than gratified, and to retire moodily within himself. Then, too, children exhibit marked differences in respect of the special directions of their feeling; as is seen in our speaking of them as "timid" or "bold," as "loving" or "selfish," and so forth. Such differences, after allowing for dissimilarities of surroundings and early education, point to congenital differences which have their physiological basis in certain obscure differences of nervous organisation.

EDUCATIONAL CONTROL OF FEELING.

Relation of Education to the Feelings. It is now recognised by the best thinkers that education is deeply concerned with the feelings of children. Both because of what they are in themselves, and because of their connections with the other mental functions, they need to be carefully watched and to be acted on beneficially.

This work of acting beneficially on the feelings of the young so as to further their highest development may be viewed in different ways. From one point of view it may be regarded as concerned with the child's own happiness. According to this view the special aim of the educator would be so to regulate the feelings of the young as to render them a source of the purest and most varied happiness.

Since, however, as we have seen, there is so close an organic connection between feeling and intellectual activity, this educational development of feeling must in a sense involve intellectual culture. Just as feeling

has to be aroused as a source of interest and a motive force in study, so, conversely, the processes of imagination and thought must be developed in order that the higher level of the emotional life may be reached. This interaction of the affective and the intellectual factor of mind is specially manifest in what is known as æsthetic culture, that is, the formation of a refined taste.

While the education of the feelings thus reaches out on one side towards intellectual culture it reaches out on the other towards the education of the will and character. Feeling has to be acted upon in various ways in order that the "springs" of conduct may be pure and wholesome. This is the ethical aspect of the education of the feelings.

Action of the Educator on the Feelings. When we speak of the educator aiding in the development of the feelings, we imply that the sensibilities of a child are capable of being acted on by his social environment. This may not at first sight seem evident. The means of stimulating the intellectual powers of a child seem to lie ready to the educator's hand. He can set objects before the young eye, suggest trains of ideas by means of words, and so directly act upon the growing intelligence. But how is he to work on the feelings of a child? how, for example, to excite a feeling of pity or of shame when this seems to be wanting? Common observation shows, however, that children's feelings are to a considerable extent under the control of those with whom they live; and we have to inquire into the means by which this influence is exerted.

It must, I think, be allowed that this action of education on feeling is largely indirect. We modify the life

of feeling by changing the environment. The introduction of a suitable companion to a lonely child has had profound effects on his states of feeling. The educator himself, as a prominent and powerful personality in the child's environment, shares in this influence, and can direct it to the best results. Not only so—and this is probably the most important influence—education works upon the life of feeling by developing those groups of ideas which nourish and sustain this life, *e.g.*, ideas about man's history, his past achievements, and our indebtedness to these. On the other side, as we shall see later, a powerful regulative action on feeling is effected by way of moral education, through the training of the young will in self-control. A more direct influence comes in when the parent or teacher, in presenting objects and ideas fitted to call forth feeling, draws the learner's attention to the noble or pathetic aspect of the presentations, and, what is of greater importance, shows a genuine personal appreciation of this aspect. In this way the impulse of imitative sympathy, so strong in normal children, is made use of.

Need of Studying the Conditions of Feeling. A salutary action of the educator on children's feelings presupposes a careful study of their characteristics and conditions. It is now commonly recognised that a teacher's work is furthered by surrounding it with an atmosphere of happiness or, as Jean Paul Richter calls it, cheerfulness.[1] A child will only do his best when he finds pleasure in his work. In order to promote this cheerfulness of mood its conditions have to be carefully

[1] On Jean Paul's distinction between cheerfulness and enjoyment, see *Levana*, edited by S. Wood, frag. iii., ii.

studied. The surroundings must be favourable to bodily comfort and agreeable to the eye, the work selected must be well adapted to the powers of the child, so as to provide full occupation of mind without wearisome strain, and the teacher's own manner must radiate the brightness of a good and happy personality.

It may be well to add that this idea of making learning pleasant, which we owe to Locke, does not mean that every part of it should at once prove enjoyable to the small learner, and that nothing irksome should ever be introduced. As we have seen, contrast is a vital principle of feeling, and no contrast is more delightful than the change from what is relatively unpleasant to what is pleasant. It is to be remembered, further, that a strenuous and even disagreeable effort is often needed in taking up some new subject of study or line of activity in order later to enjoy the full sense of mastery, and to enter into the fruition of a genuine and lively interest in the subject. Lastly, it is evident that without bracing exertions of this kind learning can never become all that it is capable of becoming as a *moral* discipline.

A similar line of remark applies to the use of the principle of Change or Variation. We are very apt to forget, what an experienced thinker about education has told us, that "monotony is the greatest enemy a teacher has to deal with". Yet while the teacher has to meet and gratify up to a certain point a child's craving for novelty, by varying his way of putting a fact, by introducing new illustrations and so forth, he must not allow himself to be dominated by this craving. Without a certain amount of repetition in the presentation of knowledge-material a child's mind will not gain

a strong grip of the elements, and without this strong grip the higher enjoyment growing out of a full understanding of the subject is unattainable.

Another principle which can be made good use of by the skilful teacher is that of Association, a principle emphasised by Locke, Miss Edgeworth, and others. Both the likes and the dislikes of children may be profoundly modified by the action of association. As Locke has so well shown us, occupations which would otherwise seem arduous and even repulsive to a child may be made to look inviting when they "insinuate themselves into them (the children) as the privilege of an age or condition above theirs"; and, conversely, if you make your boy play at top so many hours a day, and thus associate the idea of a compulsory task with his game, "you shall see he will quickly be sick of it".[1]

The action of education on the several emotional states is commonly said to have a negative or repressive side, and a positive or stimulating side. Although these two directions are necessarily carried out together, as parts of one process, there will be a convenience in viewing each separately.

(*a*) THE RESTRICTIVE ACTION OF EDUCATION ON THE EMOTIONS. Our scheme of emotional development at once suggests that in the early instinctive feelings the educator is confronted with adverse forms which must be brought under restraint. Outbursts of angry passion, for example, have to be brought under some control, partly because of their physical and moral injuriousness to the child, partly, as we have seen, because they disorganise the intellectual processes and

[1] *Thoughts on Education*, §§ 76 and 129.

so thwart all efforts to instruct. This subjugation of violent passion forms, indeed, one great aim of the "education of the feelings".

The work of subduing the turbulence of feeling in the first years of life is in some respects a peculiarly difficult one. The very violence of the emotion blinds the mind and so renders difficult any attempt of the educator to reach and influence the child's mind when under its sway. Moreover, the great agency by which, as we shall see by-and-by, the torrent of passion is stemmed, namely, an effort of will on the child's own part, cannot be relied on in the case of the very young. Threats of punishment at such a moment of wild excitement may only too easily add to the storm, or at best merely divert it into a new direction. On the other hand, the changefulness of the childish mind is favourable to the diversion of attention from the exciting cause of the passion as soon as the worst violence has spent itself.

In addition to this difficult task of grappling with the force of passion when it is actually excited, the wise educator will aim at weakening the underlying sensibilities. In the matter of the passions it is emphatically true that prevention is better than cure. Where a child has a strong disposition to violent outbursts of temper it may become necessary to act upon his environment protectively, shutting out for a time, so far as possible, the worst provocatives of the feeling. In this way, the disposition may be weakened by disuse, and so the effort of self-restraint made easier.

I have already touched on the indirect action of the educator on the child's states of feeling by way of the intellectual processes. This holds good of the problem

of moderating the passionateness of the early years. By developing a child's intellectual activities, by exercising him in calm reflection, we are building up new forces which may act as a wholesome counterpoise. In this way, for example, children's first foolish terrors will be undermined, as the weird superstitions of the nursery gradually dissolve under the genial influence of a knowledge of nature and her laws. Similarly, the violence of childish grief becomes tempered by the development of judgment, and the ability to view things in their real proportions.

More difficult problems arise later on when unhealthy forms of feeling, *e.g.*, jealousy, despondency, bitterness, and the like, are apt to develop and to secrete themselves from others' observation. It is here, perhaps, that the need of knowing our children individually shows itself as most imperative; for until this condition is satisfied we are not in a position to act restrainingly upon, and may, very possibly, in our ignorance be fostering, the very temper that we would, had we known of its existence, have resolutely set ourselves to discourage.

As I have already hinted, education is never merely repressive. Even so ugly looking a feeling as anger must not be wholly repressed, but rather purified, and taken up into the service of some higher sentiment or interest, such as love for some person, or for humanity. Not only so, we only act successfully in weakening the force of one kind of feeling by developing, and so increasing the force of, some other and better feeling. In this way, the first virulence of anger and envy gives way to the salutary influence of new feelings of tenderness and sympathy.

(*b*) Stimulative Action of Education on the Emotions. It follows from what has just been said that what we call the culture of feeling is largely concerned with the problem of strengthening and developing certain emotional tendencies. This applies in a special manner to those which come later in the order of development, *viz.*, the social feelings and the abstract sentiments. The formation of the higher interests, intellectual and æsthetic, and the development of the social feelings and a sense of duty, are effected by this positive action of education. Such stimulative action is, of course, limited at first. As Waitz observes, in the early stages of development repression is the main thing, whereas stimulation becomes more and more important as the child develops.[1]

Since, as we have seen, emotions are developed by a succession of excitations, the educator has to secure the due emotional exercise. There are, as suggested above, two principal agencies of which he can avail himself here. (1) First of all presentations may be set before the young mind which are fitted to excite the particular variety of emotion desired. Thus, by bringing before a child's mind some instance of suffering, the parent or teacher aims at directly evoking a feeling of pity. As supplementary to this presentation of suitable objects and ideas, the educator may, by inducing the child to put forth his activities, set him in the way of acquiring new experiences for himself, and so of discovering new modes of pleasurable feeling. In this manner an indolent, unambitious child may be roused to activity by

[1] *Allgemeine Pädagogik*, pp. 146, 147. Waitz is here arguing against Rousseau's idea that education can be *merely* negative.

a first taste of the pleasures of success and the delight of well-earned commendation.

(2) In the second place, the stimulative fostering action of education works through the control of the child's environment. Children tend, through the play of an imitative sympathy, to reflect the feelings they see habitually expressed by those about them, and more particularly those whom they are fond of and to whom they look up, such as their parents, teachers, and companions. The educator has to avail himself of this principle and to see that the child is set in a medium where good and worthy feelings exhibit themselves.

The aim of the educator in developing the feelings should be to build up strong and permanent attachments or "affections" for worthy things, persons, and modes of activity. Here the principle of associative cumulation dealt with above has an important practical bearing. A deep feeling of regard for the home, for the school, for the parent, or for the teacher, is highly complex, the product of a slow process of growth. In seeking to develop such a feeling, the educator must aim at supplying the requisite excitants, partly by bringing into prominence as far as possible the love-provoking features, partly by surrounding these with fitting accompaniments, so as to build up a harmonious group of associations.

In order to develop any permanent "affection," the educator has, on the one hand, to guard against a too frequent indulgence of the feeling, and, on the other hand, to avoid a frequent wounding of the susceptibility. A boy who is continually being caressed by his mother or praised by his teacher is apt to set little store by these things. No feeling must be indulged up to the point of

satiety, and a little judicious withholding of gratification may sometimes give a new intensity to emotion. On the other hand, the educator should bear in mind that the frequent wounding of any feeling is apt to deaden it. A boy who never gets recognition when he feels that he deserves it tends to grow indifferent to it; or, if he be unusually sensitive, an even worse result may ensue in the shape of a secret feeling of resentment at injustice.

One general caution with respect to these attempts to awaken feeling is of great importance. The educator must be on his guard lest he encourage a merely outward display and affectation of feeling. The very eagerness of the parent or teacher to cultivate good feelings, and the wish of children to please their elders, are, as Locke points out, favourable to the growth of affectation.[1] The educator, especially if he or she be emotional and eager for sympathetic responses in others, may easily err by trying to force childish feeling into unnatural channels. It is well, when with children, not to show ourselves too expectant of emotional display.[2] The danger of such affectation shows how much more important it is to work indirectly on the causes of feeling by developing a child's ideas and activities than to attempt directly to call forth the expression of feeling.

Lastly, throughout this cultivation of feeling the educator must be careful not to attach an exaggerated value to mere feeling. "Sentimentalism," *i.e.*, the over-

[1] *Thoughts on Education*, § 66.

[2] "Nothing (says Miss Edgeworth) hurts young people more than to be watched continually about their feelings, to have their countenances scrutinised, and the degrees of their sensibility measured by the surveying eye of the unmerciful spectator" (*Practical Education*, chap. x.).

estimation of sensibility as such, and apart from its quality, is not unknown in dealing with young children. It is well for parent and teacher alike to remember that there are sickly varieties of feeling which it is better for a child to be without. Even good feeling, though not altogether valueless, is of very defective value so long as it remains *mere feeling.* A pity which can shed tears over a sad story but never prompts to beneficent action is but of little moral account. The worth of the social and moral feelings resides in their organic attachment as motives to definite lines of conduct.

REFERENCES FOR READING.

A fuller account of the characteristics of Feeling and of its relation to the intellectual life may be obtained by reference to the following: H. Höffding, *Outlines of Psychology*, vi.; Sully, *The Human Mind*, vol. ii., chaps. xiii. and xiv.; J. Ward, article "Psychology" in the *Encyclopædia Britannica*, p. 67 ff.; and G. F. Stout, *Analytic Psychology*, vol. ii., chap. xii. The nature of Emotional processes is specially discussed by W. James, *Psychology*, chap. xxiv.; and E. B. Titchener, *Outline of Psychology*, chap. ix.

The early developments of Feeling are described by W. Preyer, *The Senses and the Will*, first part, chap. vi., and second part, chap. xiii.; and B. Perez, *The First Three Years of Childhood*, chap. v. The reader of German may further consult G. F. Pfisterer, *Pæd. Psychologie*, §§ 7, 18, and 34.

The general aim of the education of the Feelings is treated of by the following: G. Compayré, *Cours de Pédagogie*, première partie, leçon ix.; T. Waitz, *Allgemeine Pädagogik*, 2er Theil, 2er Abschnitt ("Die Gemüthsbildung"); F. Dittes, *Grundriss der Erziehungs und Unterrichtslehre*, §§ 50-55.

CHAPTER XVII.

EGOISTIC AND SOCIAL EMOTIONAL STATES.

In the previous chapter a general account was given of the nature and varieties of Feeling. We may now go on to consider the several classes there distinguished. Here we shall follow the order of development and begin with the Egoistic Feelings, briefly discussing a few typical varieties, such as fear, anger, love of activity, with which the educator is specially concerned.

(A) EGOISTIC EMOTIONS.

Fear. One of the earliest feelings to be developed is Fear, the more intense degrees of which are marked off as Terror. In its first manifestations in infancy it appears as a shrinking away from noises, ugly-looking objects, such as a black-faced doll, new surroundings and strange animals and persons. It is held by Darwin, Preyer and others that such fears are instinctive and the transmitted results of ancestral experience, but all biologists do not accept this action of heredity. It is possible that the disturbing forces of the environment, acting on the tender sensibility of the infantile nervous organism by way of shock, may after all account for these early fears.

The true fear which comes somewhat later, *viz.*, a

shrinking *from an anticipated evil*, is the simplest form of an "emotion" pure and simple, that is to say, a feeling which has for its exciting condition not a mere sensation but a higher form of mental activity. It is a reaction called forth by the presentation of an object which as a known cause of evil gives rise to an anticipation of the same, and thus involves a simple act of mental representation. It presupposes a previous experience of pain in some form, and the formation of an association between this experience and its cause or accompaniment. This is illustrated in the proverbial dread of the child that has once experienced the pain of a burn on approaching too near the fire.

While some experience seems to be necessary in the first place to suggest danger, it is not necessary that a child should have had experience of the particular form of evil suggested in a given case. When once his mind has grown familiar with certain varieties of pain, the exercise of imagination may suffice to excite fear in the presence of new and unknown evils. More than this, the very fact that the new and unknown proves again and again to have harmful qualities may suffice to beget the attitude of alarm, *e.g.*, towards a strange dog.[1] We know how easy it is to excite fear in a child's mind by any suggestion of unexperienced evil, *e.g.*, being taken to prison—a fact well known to a certain class of nursemaids and others.[2] Such fears of unknown evils are, on account of the very *indefiniteness*

[1] I am indebted for this suggestion to Professor Lloyd Morgan.

[2] A good illustration of the child's dread of the prison is given by Mr. Anstey in his story *The Giant's Robe*. For a real child's experience of a dread of the unknown, see my *Studies of Childhood*, p. 493.

of the mental representations and the scope for imaginative activity, among the worst.

As a form of painful feeling we should expect fear to have a depressing effect on the mental and bodily activities. The peculiarity of this emotion, at any rate in its intenser forms, is its unnerving and disabling character. The intellectual processes are arrested, the attention is rigidly held by the exciting object, and the imagination is apt to be inflamed to a perilous degree. Abject terror thus deprives the mind of its wonted power. And there is something analogous to this in the physical prostration which accompanies the state :—

> " Desponding fear, of feeble fancies full,
> Weak and unmanly, loosens ev'ry power ".

Children have in general a strong instinctive tendency to this emotional reaction. A little experience, moreover, enables them to realise their special liability to evil through their bodily weakness, their ignorance, and their inability to cope with danger, and thus strengthens the instinctive disposition. The natural timidity of children may be said to be one of nature's ways of protecting them against the many dangers which surround them. This characteristic is, moreover, intimately connected with the earliest form of the social impulse, *viz.*, to seek the presence and companionship of others as a mode of security, and to look to them for protection and guidance.

The educator is concerned with this feeling in different ways. First of all, he has to guard children against all the more violent paroxysms of terror, and more especially to discourage groundless and debasing forms of the emotion, such as fear of the dark, and superstitious dread of

bogies and the like. Here it is of the first importance, as Locke reminds us, to avoid all suggestions which may give rise to childish fright, and especially to refrain from over-indulging children in sensational stories about hobgoblins and so forth. The literature supplied to children is often mischievous in exciting terror. Mrs. Burnett tells us that the first story which she recollects bore the cheerful title, "The Slaughter of the Innocents".

The educator needs to study the causes of children's fear, and to work benignly on the emotion by trying to counteract these causes. Children often connect ideas of danger with things as the result of accidental associations. Miss Edgeworth gives as an instance the dread of a child for a drum which he first saw played by a merry-andrew in a mask. Such harmful associations should be neutralised by the formation of agreeable and comforting ones. Children's tendency to fear must be corrected by the development of the opposite feeling of courage and self-confidence; and this again means that the intelligence must be developed, so that imaginary causes of fear may be recognised as such; also, that the will be exercised in examining what looks alarming, so as to ascertain its harmless character.

While the educator has thus to seek to restrain fear and to divest it of its overpowering and debasing violence, he has at the same time to preserve and to make use of the feeling in its milder forms. When children are just outgrowing these infantile terrors they are apt to show a foolish recklessness in encountering danger. Here it is desirable to cultivate a certain cautiousness and apprehensiveness. And generally the educator has to develop fear in connection with other and

worthy feelings. Thus, while he may have in certain cases to discourage the natural fear of bodily pain, and the dread of being laughed at by companions, he will do well to encourage the fear of offending parent or teacher, of causing pain to another, and of losing others' respect, and, generally, of what Plato calls proper objects of fear.[1]

As these remarks suggest, the educator needs the emotion of fear, when robbed of its passionate violence and reduced to a calm far-seeing apprehension of evil, as *a motive force.* Every governor has to work to some extent on the impulse to shrink from what is harmful, and the teacher is no exception. Here, however, he must be careful not to excite the emotion in its unnerving and prostrating intensity; for by so doing he may unfit a child for doing the very things which he requires him to do. Where, however, the threatened evil is definitely known, and can be calmly looked forward to as being contingent on certain actions of our own, fear becomes an effective and invaluable force as a motive: all sane men are under the empire of the feeling in this sense. A child who knows no fear is, strictly speaking, uneducable: consequently he must be brought under its control. In thus subjecting a child to the rule of fear, however, we shall do well to make appeal to the higher and worthier forms as soon as may be.[2]

ANGER, ANTIPATHY. To the same class of primitive and instinctive feelings must be referred the emotion of Anger. It resembles fear in the fact that it is a

[1] See *Republic*, iv., pp. 420, 429; *cf.* Aristotle's *Ethics*, chap. vi., 2.

[2] Schmidt remarks that the fear of physical chastisement fills a larger and larger place in education as we go down the scale of culture to savage races.

reaction called forth by an experience of pain. Only in this case the pain is actual and not prospective, and is viewed as a hurt or injury inflicted by somebody or something. Unlike fear, however, anger has a distinctly pleasurable ingredient. We speak of the "gratification" of the angry passions. The reaction of anger proper, or resentment of injury, contrasts with that of fear in having a markedly energetic form. A child in an angry passion is not prostrated and paralysed, as in the state of fear, but is roused to a state of violent muscular action, shrieking, wildly gesticulating, stamping, jumping up and down, striking, kicking, throwing things about, and even destroying them. Baffled anger in the child takes on much the same expression as the poet makes it take on in the man :—

> " He swells with wrath ; he makes outrageous moan :
> He frets, he fumes, he stares, he stamps the ground ".

At the same time the violence of the activity and its irregular and spasmodic character make it wasteful of energy and so baneful. A fit of angry temper exhausts the strength of the child.

In its simplest form, as seen in the passionate outburst of an infant at the beginning of life, anger is the direct outcome of physical pain, and may be described as the natural protest of a sentient creature against the dispensation of suffering. Later on—according to Darwin before the end of the fourth month—this primitive mode of reaction on the experience of pain becomes differentiated into the emotion of anger proper. This true feeling of resentment involves a sense of injury. It is closely connected in its origin with the animal impulse of combat, and probably derives its energetic character from

this circumstance. Viewed in this way as a self-defensive reaction it may be seen, like fear, to have its root in the instinct of self-preservation. The pleasure which attends the indulgence of angry passion is probably connected with the circumstance that the passion rouses to the fullest the energies alike of body and of mind, and, when unimpeded, constitutes the satisfaction of the most powerful of our animal instincts.

As implied in what has been said children are much under the dominion of this primitive passion. They resent suffering and vent their resentment in outbreaks of impotent childish temper. Not being able as yet to distinguish carefully between intentional and unintentional injury, they are at such times wont to pour out the vials of infantile wrath on the unoffending head of their doll, or toy-horse, or on any other inanimate object which happens to cause them annoyance.

The anti-social emotion of anger shows itself in a variety of forms. Being closely allied in its origin with the instinct of combat, it accompanies all the more exciting varieties of contest. The resentful instinct is apt to develop into a conscious impulse to inflict pain, and under this form of "malevolence" it frequently associates itself with the love of power in its coarser and more brutal forms, and constitutes a prime ingredient in the well-known boyish type, the "bully". It shows itself in certain forms of childish cruelty both towards animals and other children. Although, as I have elsewhere argued, much of the so-called cruelty of little children towards flies and the like is innocent of the desire to inflict pain —being the result of a want of imaginative apprehension —there is a genuine love of cruelty in some bigger ones,

as is illustrated in the "ragging" of schoolboys, which, as has been proved, is only persevered in when it is seen to torment.[1] The same combination of love of power and resentment makes its harsh voice heard in the shout of contemptuous ridicule.

When deprived of its sweet satisfaction angry feeling is apt to develop into a nascent hatred or antipathy. The envious child is quick to conceive such lasting dislike for those who enjoy the favours which he himself covets. Children may readily acquire, too, a permanent animosity or hatred towards those who domineer over them and excite their fears. What Shakespeare says of adults is true of children:—

> "In time we hate that which we often fear".

Even oft-repeated and persistent thwartings of young impulse and taste may suffice to breed a lasting dislike of those who wield authority. So slight an injury as the presence of something offensive in the appearance of a person may suffice to awaken a kind of resentful dislike in the breast of a sensitive child. In the case of one child, the wearing by a woman of short crisp curls different from those of other women constituted the offence and ground of dislike.[2]

As the anti-social feeling which divides man from

[1] According to Dr. Bain, there is a delight in the spectacle of suffering which forms the core of the gratification of the malign passion (*The Emotions and the Will*, chap. ix.), and he applies this idea to the elucidation of children's cruelty (*Education as a Science*, p. 72 ff.). Locke, on the other hand, regards cruelty as acquired, and as due to bad education (see *Thoughts on Education*, § 116). Compare the full discussion of the question of children's cruelty in my *Studies of Childhood*, p. 239 ff.

[2] See *Uninitiated*, by Isabel Fry, 116, 7.

man, the emotion of anger, though useful and necessary to the individual, makes a heavy demand on the restraining forces of the educator. It would clearly be fatal to the happiness and the moral development of the child to humour its temper, and to allow its outbreaks of angry passion to go unchecked. The brute-like violence of infantile temper must be assuaged.

The passionate child must be appealed to on its human and reasonable side. At first the provocatives of violent outbursts must be avoided; and, since the educator has to occasion a considerable amount of annoyance by the restraints of discipline, he should take particular pains to prevent the growth of anything like vindictive feelings towards himself. To this end he should avoid every appearance of irregularity, caprice, and unfairness in his mode of government.

In seeking to tame the forces of angry passion, the educator has, as already hinted, to work to a large extent *indirectly* by developing the child's reflective powers. As Miss Edgeworth well says, apropos of the management of children's temper: "You must alter the habits of thinking, you must change the view of the object, before you can alter the feelings". Thus a cross and querulous child should be led to see that much which appears to be an intended injury is not really so, that playmates are often blind to the harmful results of their actions, and that those whom in his haste he is disposed to think unkind, more especially his parents and teachers, are his true friends. Side by side with this cultivation of thoughtfulness the educator should exercise the feeble young will in checking and bringing under the turbulent forces of passion.

Here, too, as in the case of other natural and normal feelings, the educator must remember that his function is not that of extirpating something wholly bad. The impulse of anger is a necessary endowment of the human being as of the animal, and has its proper and legitimate scope. It is no doubt true that society by taking the punishment of the more flagrant offences into its own hands deprives the individual of the fullest indulgence of his vindictive instincts. At the same time it is equally plain that it allows him a certain modest field for the exercise and manifestation of the retaliative impulse. Nor does the government of children relieve its individual subjects of all necessity of self-defence. On the contrary, as soon as the school age arrives at any rate a boy or a girl is required to feel and to assert his or her individual rights and to meet attempts at injury by an unmistakable display of self-protective spirit. Any tendency to a tame submission to bullying, so far from being a good thing, is distinctly bad; and headmasters and others would do well to encourage much more than they do sensitive and submissive children to protect themselves against such suffering by calling in the aid of authority.

Not only so, a smack of resentful feeling is needed to give life and vigour to other emotions. No feeling, perhaps, is susceptible of such curious transformations as this, when it enters as a subordinate element into other and worthier ones. In the good-natured laughter called forth by comedy, the element of resentment—though certainly present, and giving a certain zest to the enjoyment—is shorn of much of its ugliness. Again, in the indignant revolt of the child-mind against the very

idea of cruelty, whether to man or brute, anger is not only stript of its unloveliness, but assumes a worthy and admirable aspect. By developing a wide sympathy with the sufferings of others the educator may help to humanise the instincts of resentment, by transforming them into a genuinely disinterested sense of justice.

Love of Activity and Growing Consciousness of Power. We now pass to a feeling of a different order, *viz.*, the pleasurable emotion which accompanies a full putting forth of our energies, and is popularly known as the love of activity. It is an egoistic feeling, since it helps to maintain and to further the individual and his vital interests; a child that derived no enjoyment from realising his powers would be unfitted to maintain himself in the struggle of life. It is, moreover, a feeling which the educator has to foster and utilise as a motive, rather than to repress. It supplies, indeed, one of the well-recognised educational motives.

As pointed out above, all activity, when adapted to the powers engaged, is attended with a sense of enjoyment. Where there are a vigorous body and brain and an adequate recuperation of energy by periods of repose, there arises a strong disposition to activity, so that the slightest opening or stimulus is seized upon and utilised. This readiness to put forth energy, which is especially observable in young vigorous creatures, has been called "spontaneous activity". Such an active disposition shows itself, as we may see in the case of children and young animals alike, not only in play-like movement, but in the observation and examination of new objects.

The feeling acquires more of the complexity and the dignity of an emotion when the spontaneous activity

meets with a momentary check. This excites a special exertion and involves a much more distinct *consciousness of our powers.* One may observe the germ of this feeling in the first half-year, *e.g.*, when a child succeeds in reaching a toy which has got away and announces his success by a grunt of satisfaction.

This delightful sense of power is experienced whenever the child succeeds in doing something that it could not do, or was not aware of being able to do, before, *e.g.*, opening a watch, or standing upright. It is also realised in a less intense form, when any action, which was before felt to be difficult, becomes sensibly easier. In this way it connects itself with the child's comparisons of his present with his past self, and the sense of progress.

The full enjoyment of power derives much of its gratification from the social surroundings. In the face of elders, such as parents and the teacher, a child is conscious rather of its weakness than of its strength. And this sense of inferior ability may readily grow into a distinctly painful feeling, and attach to itself an element of resentment. But children have a way of recouping themselves for any humiliation from this source by emphasising to the utmost their superiority to other children.

The emotion of power is capable of growing into a permanent emotion or affection, *viz.*, the agreeable consciousness of ability and of self-sufficiency. This is a higher form of the emotion, involving more elaborate processes of reflection. In this permanent form it enters into what we call Pride or Self-respect.

The development of the love of activity and the elating sense of power is a phase of child-life which requires the

educator's careful watching. Children are, as Locke observes, greedy of dominion. This impulse leads them to enlarge the sphere of their action to the invasion of others' proper spheres, in order to prove their superiority to others in bodily strength, or in material possessions. Hence, it is evident, the natural play of the emotion has to be restricted within certain limits. When thus restrained, however, it becomes a most valuable incentive to exertion. A right ambition to get on, to grow in strength, knowledge, and skill, is the prime source of youthful effort.

In order to enjoy the sense of power, a child must, it is evident, have a certain liberty of action. The *suffering* of restraint arises from the consciousness of fettered energy. A child only does his best at anything when he has a consciousness of self-activity. To throw an appearance of spontaneity into school-work is, as Locke saw, the most certain means of rousing the young energies to their full tension. The kindergarten undoubtedly owes much of its popularity among children to the circumstance that restraint is kept in the background, and activity made as play-like as possible.

During the period of school instruction there might seem at first to be hardly any scope for the application of this principle. The very conception of teaching as a mode of external control, demanding a concentration of attention in a certain direction, excludes the full delight of spontaneous activity. Not only so, a teacher has to assist the faculties of the child, and so keeps him in mind of his intellectual weakness. Yet after allowing for all this it remains true that all efficient instruction proceeds by developing and satisfy-

ing the love of activity. The old humiliating *regime*, which met with a sneer any spontaneous effort of the child's mind to think, is slowly giving way at last to a wiser as well as a more humane *regime*, in which such efforts are not only allowed but encouraged as essential elements in a true process of learning.

Not only so; as was suggested above, a teacher by raising learning to the rank of a dignified pursuit may excite the ambition of his pupil to attain to this dignity. Children never have so keen a sense of growing power as when they are trusted with some new and important task. Even the least inviting kind of work has been known to grow not only palatable but actually desirable to the young mind when it is thus invested with the semblance of responsibility and dignity. That real boy of fiction, Tom Sawyer, made the other boys of his village, just starting for a holiday excursion, eager to relieve him of the task of whitewashing the fence by pointing out that a body does not "get a chance of whitewashing a fence every day".

Finally, children should be led, so far as they are able, to realise the advantages which progress in the path of knowledge brings with it. The increased ability to converse with older folk which comes from the growth of intelligence is itself no small gain to a child, and he should be encouraged to enter into the fruition of this gain.

Feeling of Rivalry. Closely related to the feeling of activity is the emotion of Rivalry. This, too, springs out of a consciousness of activity. It is the characteristic emotional state which accompanies the putting forth of exertion in competition with another. It supplies the

familiar form of excitement which enters into all contest. This condition of excitement is partly the result of the strenuous activity which the stimulus of competition evokes. But its chief ingredient is the delight in combat as such, and this delight owes much to the anticipation and realisation of the gratification of the feeling of Power. Children love contest because they rejoice in *proving their superiority to others.*

The feeling of rivalry begins to manifest itself as soon as the consciousness of power and the ambition to do things develop. It has its roots in the instinctive love of combat, as we may see in the play as well as in the more serious contests of children and young animals. Children, especially boys about the age of eight and onwards, come much under the sway of this feeling. Association with other children of about the same age gives ample opening for the excitement of contest. And many a child who if left to himself would be comparatively inactive is roused to strenuous exertion by this stimulus.

The feeling manifests itself in a variety of forms. In some of these its anti-social character or tendency is hardly observable, whereas in other forms this becomes clearly marked. Much of children's activity has in it a subordinate element of competition, even though no thought of outstripping and vanquishing another and no distinct feeling of antagonism may be developed. This remark applies to many things which they do under the stimulus of example, as in trying to do what they see their elder brothers and sisters do. The impulse here is largely one of imitation and of personal ambition, with that of rivalry thrown into the background.

The emotion becomes more clearly differentiated, and

shows its anti-social character better, in situations of contest, properly so called, where superiority to another is directly aimed at. In the case of bodily combat or fighting "in earnest" the feeling of rivalry is at its maximum intensity, being sustained and inflamed by angry passion. In calmer contests of physical strength or skill, *e.g.*, in athletic sports, where the blood is not heated, the hostile element of anger is kept subordinate. At the same time the presence of the feeling in a repressed form is seen in the fact that even here triumph over competitors is very apt to develop the exulting consciousness of superiority, while on the other hand the sting of defeat is apt to develop a germ of hatred towards the successful rival. It is, indeed, this strong tendency in the emotion of rivalry to pass into the full state of hostility that gives its dignity and merit to "friendly rivalry," that is, a competition in which "good form" or the rule of the game compels the aspirants to repress as far as possible the element of animosity.

The educational treatment of this feeling is a matter of peculiar difficulty. It is so strong an incentive to mental as well as to bodily exertion, and is so directly fostered by the very constitution of the school, with its classes of children near one another in age or in ability, its examinations, prizes and so forth, that the teacher would scout the idea of dispensing with it as a motive. Nor need he seek to do so. The impulse is one of the most deeply implanted and the most necessary. It has in the past been the spring of a large part of human activity, and will continue to be so—at least as long as existing social arrangements last. The teacher is accordingly justified in appealing to it within certain limits.

Nevertheless, as a feeling with a distinctly anti-social tendency, rivalry requires the educator's careful watching. This applies with special force to the school, where the teaching of numbers together offers a wider scope for the action of competition—*e.g.*, for prizes and the many little privileges of the "favourite"—and the competitors are not so closely bound by ties of friendly intimacy.

Rivalry is a feeling which will be kept in the background in the best types of education. Children should be encouraged to aim at excellence rather for the sake of the attainment itself than for that of taking down another. As Rousseau and others have pointed out, a teacher can further this result by his mode of apportioning praise, grounding his estimate on a comparison between what the pupil has been and what he is, and not between what he is and what somebody else is. In addition to this, the educator should seek to counteract the tendency to unkindly rivalry by developing the higher social feelings. By so doing, however, he must be prepared to find that he is sapping the impulse of rivalry of much of its native vigour. What is sometimes called generous emulation, and set above rivalry, is a feeling which derives its life-blood less from the impulse of combat than from the desire for excellence as such.

The evil effects of an excessive reliance on the motive of rivalry are seen in the educational system of the Jesuits. See Quick, *Educational Reformers*, chap. iv., § 17. Cowper, in his poem "Tirocinium," satirises the system of public school competition, and says that emulation is a compound "of envy, hatred, jealousy and pride". This is no doubt an exaggeration, but hits a real defect. Our public schools

have always made much more of the rougher virtues of manliness, which the spirit of rivalry undoubtedly fosters, than the more refined virtues of gentle courtesy and kindliness.

Love of Approbation and Self-Esteem. We pass now to another and very different type of emotion. In what is known as the Love of Approbation we seem to have to do with a feeling of high moral rank, needing to be stimulated rather than, like those just considered, to be repressed.

The love of approbation is a specialised form of the more general sentiment, sensitiveness to others' notice and opinion. One manifestation of this sensitiveness shows itself early in life (in the second or third year) in the reaction known as shyness or bashfulness—which, though related to fear, is not to be confused with this—a reaction which is called forth by the presence and notice of a stranger.[1] In its later and more highly developed form love of approbation implies the pleasurable feeling of gratification which arises from the commendation and good opinion of another, and the correlative feeling of dissatisfaction and humiliation which comes from unfavourable opinion. The germ of this appreciation of others' favourable notice is seen in the first years, as, for example, in the child's simple action of going to the mother to show her something that he has done, and to obtain her look and words of commendation.

This feeling clearly has its roots in egoistic tendencies. It forms an element in a child's first rudimentary "self-

[1] An interesting account of the development of the feeling of bashfulness is given by Professor Mark Baldwin in his volume *Mental Development*, p. 147 ff. As Tolstoi remarks (*Childhood, Boyhood, Youth*, chap. xxi.), the sufferings of shy people arise from their *uncertainty* as to others' opinions of them.

feeling," that is, regard for self. A child seeks others' favourable opinion and praise because this gratifies and sustains what we call self-satisfaction.

The disposition to look to others for commendation is peculiarly appropriate to childhood. Just as the child is physically dependent on others, so he is intellectually and morally dependent. In early life children cannot form independent judgments as to the worth of their actions. Hence they turn to others for the gratification of the self-feeling and accept their estimates. As Locke has it, "reputation" is the proper guide and encouragement of children till they grow able to judge for themselves.

Although the desire for others' approval has, as we have seen, a distinctly egoistic side, it has a social side as well. For in wishing to stand well with others, and especially his elders, a child is paying these a certain respect. Moreover, the working of this impulse to seek commendation from others necessarily involves a certain amount of attention to those of his actions and traits which respectively please and offend them. In this way the habit of looking for others' praise becomes a stepping-stone to a much higher attainment, *the desire to please*, that is, give pleasure to others.

This double aspect of the feeling reflects itself in the unequal dignity of its several forms. An indiscriminate greed of others' consideration and praise, without any reference to the value of the praise, is one of the most disagreeable, as also one of the most harmful, of childish traits. It is apt when indulged to lead to silly forms of vanity, *e.g.*, that of good looks, and readily gives rise to other unlovely dispositions, such as envy of those who win

more praise than the child himself, and overbearingness towards those who are less fortunate. In its later and more developed form—thirst for popularity and glory—it is no doubt a mighty stimulus to effort, yet it enfeebles the character by inducing a habit of estimating things wholly by a reference to others' opinions and standards of value.

On the other hand, a discriminating love of others' good opinion, a strong sense of the value of *the approval of certain persons*, is bracing and elevating. Where the desire for others' esteem is directed by affection and respect, it becomes one of the most valuable of educational forces. As Locke saw, it may be made, in the scheme of home education which he had in his mind, to be a very effective substitute for the rivalry of the school.

In appealing to this motive the educator should temper and restrain the feeling, and keep it from becoming a foolish craving for the mere forms of praise, or a wild passion for admiration and popularity. He should, further, enlighten it by pointing out that the verbal forms current in the courtesies of life are not always sincere, that some things, *e.g.*, good looks, though agreeable and fit objects of complacency, are not entitled to commendation, and lastly that the only opinion worth having is that of a wisely discriminating and perfectly candid friend. He should be careful too, in apportioning his praise, to avoid wounding the feeling. Not to have one's effort and merit recognised, where such are supposed to exist, is one of the greatest of childish sufferings, and has in it the smart of injustice.

Finally, the teacher should remember that the end of education is self-reliance and independence. While it is well for a child of six to go by what others say, it is not

well for a youth of sixteen to take the measure of his own worth altogether from others. By sifting good opinions and distinguishing whose are most valuable, a child should be gradually forming a standard, by a reference to which he will himself be able to judge of the worth of his actions. As the school life nears its close, the habit of looking for the teacher's approval should give place to the higher habit of independent self-scrutiny and self-judgment.

To know just when and how to slacken the leading strings here, and to encourage a child to form his own opinion, requires much judgment in the teacher. If most children, perhaps, are apt as they grow to lean to a weak extent on others' estimate of them, a few display an obstinate self-conceit in defiance of others' opinion. A child that has been indulged in forming exaggerated estimates of his importance under the baneful influence of parental "bringing out" is apt to bring something of this cheerful self-satisfaction with him to the school; in which case a taste of strongly unfavourable opinions may be exceedingly wholesome for him.

Miss Edgeworth, in her excellent chapter on Vanity, Pride, and Ambition, uses the term "vanity" for excessive dependence on others' good opinion, "pride" for the higher forms of self-complacency (*Practical Education*, chap. xi.). Vanity implies, no doubt, a desire to display, to win others' admiration, but it connotes more than this, *viz.*, excessive and foolish self-admiration on such slight grounds as personal appearance. Pride, on the other hand, while, as Miss Edgeworth says, it shows more self-reliance and independence of others' opinion, implies further an intelligent self-esteem, grounded on the perception of really valuable qualities.[1]

[1] See article, Vanity, Pride, and Self-esteem, in the *Cyclopedia of Education* (Sonnenschein), and the article, "Eitelkeit," in Schmid's *Pädagog. Handbuch*, and in Rein's *Encyclop. Handbuch der Pädagogik*.

(B) SOCIAL EMOTIONS.

Attachment to Others: Love. We may now pass to the group of emotions known as the Social Feelings. These include a variety of emotional states, the common characteristic of which is that, whilst like anger and dislike they have others as their object, they prompt their subject to seek the society of others and to find pleasure in this, and thus serve to bind man to man in bonds of friendship.

The feeling of attachment to another shows itself at a very early age, and appears to be in a sense instinctive. Children, like young animals, show themselves companionable, putting forth signs of distress when separated from the mother (or nurse), and exhibiting the clinging impulse towards her. Even the sound of the familiar maternal voice seems to comfort an infant in the solitude of the dark night. According to Professor Baldwin, the interest in personality is so keen that even in the second month a child will distinguish the mother's or nurse's touch in the dark.[1]

This feeling of attachment has, it is clear, an egoistic root: it is an expression of dependence, and is connected, as we have seen, with the impulse to seek protection. It is, moreover, largely a reflection of the various physical satisfactions and comforts which the child associates with its protector.

Such infantile attachment develops into an emotion of "fondness" when the cumulative action of experience invests the idea of the mother with a mass of grateful associations (compare above, p. 421), and when the reaction of tenderness, *i.e.*, the impulse to caress or fondle,

[1] *Mental Development*, p. 335.

is developed. A higher kind of fondness or tender "love" comes with growing intelligence and the recognition of personal qualities in the beloved object. Respect for another's superior knowledge and character may in itself be a comparatively cold sentiment, but when it combines with attachment and the impulse of tenderness it gives rise to the warmer feeling of admiring love.

Such an emotion, even when admiration is added, does not constitute all that is meant by love. When we say that a boy loves his mother we imply that he is interested in her welfare, that he wishes her well, and himself tries to further her comfort and happiness. To this higher element we may now turn.

SYMPATHY. The most important ingredient in the social feelings is sympathy. This word, as its etymology suggests (*συν*, with, and *παθος*, feeling), means fellow-feeling, *i.e.*, a participation in the sorrows and joys of others. It is this element which transforms a merely egoistic fondness for a source of benefit, and a mere delight in what it is agreeable to have near us, into affectionate concern and self-denying devotion. Sympathy is, however, not limited by the range of tender emotion. We can sympathise with the woes of those for whom we have no liking, and even with those of perfect strangers. In this wider and more detached form sympathy is synonymous with good feeling, kindness and humanity.

Sympathy, in the commoner form of participation in another's suffering, commonly involves a certain amount of pain to the sympathiser. In order to sympathise with another's distress we must imaginatively realise it, and so in a sense take it upon ourselves. Even when we

enter into another's joy, and so realise a happy state of feeling, a painful ingredient is apt to appear in the shape of envy. This fact was perhaps in the mind of Jean Paul Richter when he wrote: "In order to feel with another's pain it is enough to be a man; to feel with another's pleasure it is needful to be an angel". Yet sympathy, when accompanied by a flow of tender pity, may become in a measure pleasurable. Mr. Herbert Spencer somewhere speaks of the "luxury of pity". Children appear *to like* to show pity to animals and small things generally, if not to their elders also, when these are in trouble. Perhaps this is why they often prefer the "sad" stories which make them weep—though I think that very sensitive children who are most sympathetic and so feel *the pain* the most are wont to dislike them.

It is important to distinguish the pleasure of sympathising from that of being sympathised with. A child by receiving another's pitying words and caresses has his pains assuaged. Hence the desire for sympathy may exist in a selfish mind which is quite incapable of requiting it. In children the longing for sympathy is commonly quite disproportionate to the readiness to bestow it on others.

An important result of receiving another's sympathy is the strengthening and fixing of our feelings. Thus, a child that feels itself aggrieved may have the sense of injury intensified by the injudicious sympathising words of another. Our habitual feelings, our likings, tastes, antipathies, are greatly reinforced by the sympathy of congenial minds. On the other hand, the drawings of sympathy act as a powerful assimilative force. This principle is an important agent in what is called the

"force of example". Children tend to adopt the feelings, convictions, and so forth, of those whom they love and admire.

STAGES IN THE DEVELOPMENT OF SYMPATHY. In its earliest form sympathy is hardly distinguishable from the instinct of companionship. An infant whose grief is solaced by the cooings of the mother may be supposed to have a vague consciousness of another's fellow-feeling, an indistinct sense of "oneness". A clearer appearance of sympathy occurs when a child tends to take on imitatively the manifestations of another's feeling. This occurs frequently in the second half of the first year, the child laughing in response to another's laugh, crying on hearing another child cry, and so forth. Such external and *imitative* sympathy is strong in children, being at the bottom of their contagious excitement, and of much of what is known as "the sympathy of numbers".

In its higher and fully developed form sympathy involves an intellectual process, *viz., a distinct apprehension or imaginative realisation of another's sorrow or joy*, and the direction of the responsive feeling towards it. This emerges gradually out of the former. It first appears distinctly in the form of infantile pity. The child in its caresses of its pet animal, when hurt, or of its mother's "bad finger," displays the germ of such true fellow-feeling. This feeling prompts to an effort to solace, and, where it is seen to be possible, to remove the trouble. The disposition to enter into others' pleasurable states of mind is much less distinctly marked in the child.

In normal circumstances, and under the influence of education, the range of sympathy gradually widens. At first it is restricted to familiar home companions,

human and animal. Little by little, as the sphere of observation widens and oral instruction is added, it begins to embrace those lying outside the familiar home scene. The transition to the larger community of the school opens up new directions of personal sympathy and gives opportunity for taking part in the *collective sentiments of numbers.* Methodical culture enlarges the area of sympathy by widening the intellectual horizon, introducing the idea of a far-ranging human brotherhood, and of universal human interests, in which each of us can have his share.

This later development of sympathy in connection with the processes of culture involves *the subordination of sympathy as feeling to the intellectual process of understanding.* Fellow-feeling with another and comprehension of another's feelings and motives are to some extent distinct processes, and illustrate the affective and moral aspect of sympathy on one side and the intellectual aspect on the other. In this more intellectual process of understanding, the emotional excitement of sympathy is brought under control. In trying to understand the patriotic feelings and aims of Brutus I must not allow myself to be carried away by a passionate fellow-feeling. Similarly, in trying to enter into the ideas and aims of a poet, say Wordsworth, we must in a sense make them our own, and we shall do so the better if we can be touched with something of the poet's own fervent admiration; yet in order to understand we must make such sympathetic resonance strictly subordinate to the formation of a clear intellectual representation of "the poet's mind".

THE EDUCATION OF SYMPATHY. Sympathy is rightly looked on as one of the most valuable agencies in educa-

tion. It is needed as an aid to intellectual development, and still more as a means of moral growth. The influence of the teacher on the development alike of the intelligence and of the character depends on his establishing a relation of sympathetic friendship between himself and his pupil.

In aiming at bringing his pupil into this relation of mutual sympathy, the educator must not begin by expecting too much from the side of the child. Our analysis of the process of sympathy tells us that in its higher forms it presupposes conditions which are not realised in the first years of life. A child is apt to be lacking in experience, in the close observation of the signs of others' feelings, and in the imaginative self-projection into new and strange situations and experiences, which underlie all the higher human sympathy.

It follows, then, that the teacher, in trying to develop a sympathetic *rapport* between himself and his pupil, must himself take the lead. He can enter into the child's familiar and simple experiences, though he cannot as yet expect the child to understand his unfamiliar and complex feelings. This calling forth of affection by showing affection is apt to be a slow process, for children have not the intelligence needed to appreciate what is being done for them, and are disposed to think rather of the present restraints imposed by the teacher than of any resulting benefit of his instruction in the future. As Miss Edgeworth remarks: "Gratitude is one of the most certain, but one of the latest, rewards which preceptors and parents should expect from their pupils".

No doubt, the teacher has fewer opportunities than the parent for winning a warm affection from children.

Still, much more may be done than is often supposed. The child has his hardships at school. Study is not always a delight, especially at the outset. Here is the teacher's opportunity for bringing to bear the magical power of sympathy on the work of intellectual instruction. These overtures should be followed up by offers of companionship outside the class, in the playground and elsewhere.

If in these and other ways a teacher has done his best to prove himself the child's friend he may hope in time to win a responsive sympathy and a habit of consideration from the learner. The securing of this sympathy on the part of the child is of the first consequence to success in teaching. The wish to please one who is an object of affection as well as esteem is one of the most valuable spurs to intellectual industry. A child that has real affection for his teacher will, as we have seen, come under the magnetic influence of that teacher's personality so as to respond harmoniously to his wishes, his enthusiasms, his tastes. And this disposition to catch the teacher's spirit has been known to work marvels in the way of powerfully attracting boys and girls to subjects which would otherwise have been unattractive.

Hardly inferior to this influence on intellectual activity of a close sympathy between teacher and learner is that of a sympathy among the learners themselves. A child brought into a class which exhibits a lively interest in the subject of instruction will tend by the mere force of emotional contagion to take on something of the prevailing feeling. Bright, eager class-mates are a potent stimulus to the individual child. This is one important ingredient in the influence of numbers in education.

Where the relation between the learners grows closer, and a bond of friendship arises, a new force is supplied which may work in the direction of intellectual industry. Many a young intelligence has brightened under the genial influence of a daily sympathetic contact with a more active and capable mind.

While sympathy is thus valuable as an aid to intellectual training, it forms a necessary ingredient in moral training. As we shall see presently, a readiness to consider others is a vital element in a good or moral character, and a large part of the problem of developing virtuous dispositions consists in knowing how to cultivate a habit of sympathy.

In educating the sympathies special care is called for. The educator should guard against the formation of a habit of indulging forms of sympathetic feeling which do not impel to work for the relief of suffering. Hence the feelings of pity should not be wholly or chiefly called forth at first by touching stories, but rather by the presentation of actual instances of suffering which offer some scope for benevolent exertion.

The school, though it offers a certain field for the encouragement of sympathy with actual distress, works on the higher sympathies mainly by the presentment of human experiences which are inaccessible to any beneficent action. Here the object aimed at should, as has been said above, be a clear understanding and just appreciation of the ideas, feelings and aims, both of the individuals and of the communities dealt with. In the study of literature, for example, the instructor should seek to make the subject an instrument for the education of the sympathies by focussing attention on the person-

ality of the writer, his life and experiences, and his special ideas and aims as expressed in his writings. Similarly in teaching history, while the learner's anti-social feelings may have now and again to be appealed to and gratified, the educator's great aim should be to develop a large appreciative sympathy with the many-sided life of a nation, his own, and others differing widely from this. In this way, through the workings of sympathy, the great human interests will gradually be entered into.

REFERENCES FOR READING.

For a fuller psychological account of the Egoistic and Social Feelings, the student may refer to the following: Sully, *The Human Mind*, vol. ii., chap. xv.; and H. Höffding, *Outlines of Psychology*, vi., C.

On the early development of these feelings in children, see B. Perez, *First Three Years of Childhood*, chap. v.; Sully, *Studies of Childhood*, vi. and vii.; G. Compayré, *Intellectual and Moral Development of the Child*, chap. v. With these may be read the article, "A Study of Children's Fears," by G. Stanley Hall, in *The American Journal of Psychology*, vol. viii., p. 147 ff.

On the educational management of these feelings, consult A. Bain, *Education as a Science*, chap. iii., and H. Marion, *Leçons de Psychologie*, leçons 15 and 16.

The subject of angry passion is specially dealt with by Maria Edgeworth, *Practical Education*, chap. vi.; by Locke, *Thoughts*, § 111 and following; also in the articles, "Leidenschaftlichkeit" and "Sebstbeherrschung," in Schmid's *Pädagog. Handbuch.* The educational use and abuse of rivalry are discussed by G. Compayré, *Cours de Pédagogie*, pt. ii., chap. xi.; also in the article, "Wetteifer," in Schmid's *Pädagog. Handbuch.*

The love of approbation ("Reputation") is dealt with by Locke, *op. cit.*, § 56 ff. The cultivation of the Sympathies is dealt with by Miss Edgeworth, *op. cit.*, chap. x.; Madame Necker, *L'Education Progressive*, livre v., chap. iv.; J. P. Richter, *Levana*, translated by Susan Wood (Sonnenschein), sixth fragment, chap. iii.; also in the article, "Mitgefühl," in Schmid's *Pädagog. Handbuch*, and in the work of F. Dittes, *Grundriss der Erziehungs und Unterrichtslehre*, §§ 66-68.

CHAPTER XVIII.

ABSTRACT SENTIMENTS.

In the present chapter we shall be concerned with the third order of emotional states, which I have marked off as the Abstract Sentiments. The full development of these belongs to the period of adolescence and maturity; but the germs appear in early life, and it is an important part of the work of education to develop and strengthen them.

(A) THE INTELLECTUAL SENTIMENT.

The first of these sentiments is one with which the educator is specially concerned in connection with the processes of intellectual culture. It is commonly marked off as Intellectual Feeling or as Logical Feeling. It may be appropriately distinguished as the Intellectual Sentiment. Strictly speaking the name stands for a group of closely related emotional states which are developed in connection with the intellectual processes. They are frequently described as the "pleasures of knowledge," and when developed into the permanent form of an affection they constitute the "love of truth". Under the aspect of active or action-prompting feeling this sentiment answers to what we call intellectual interest and curiosity (compare above, p. 147 ff.).

Feeling of Wonder. It is commonly said that a feeling for the value of knowledge, as well as the desire for it, begins with a feeling of wonder when we are confronted with something new and not readily assimilated. This may not be strictly true, since we should enjoy something of the pleasures of knowledge, even if the assimilative process were never arrested and baffled. It is indisputable, however, that wonder is the starting-point in all the keener processes of intellectual quest, and contributes an important element to the intenser enjoyment which accompanies these.

Now wonder at what is new, and especially at what transcends the common level of experience, is apt, in children and adults alike, to become an intoxicating pleasure, what we call the delight in the marvellous. Such an emotional excitement, so far from being an intellectual feeling, may easily oppose itself to the pursuit of knowledge. We all know how the superstitious mind which clings to its marvels resents any attempt to explain them by help of natural causes.

When, however, the passion for the marvellous is brought under control, the very strangeness of the marvellous appearance is fitted to call forth the inquiring attitude, to prompt, for example, the questions: "What is a rainbow?" "How did it get there?" Children's questions are, in many cases at least, the outcome of a feeling of wonder.

The mere feeling of wonder in presence of the unknown may take on a distinctly painful character when the inquiring attitude is baffled. A child that wants to know something, say, where he was before he was born, and cannot get a satisfactory answer feels what we call

perplexity. This mental state implies an effort to understand and a baffling of this effort. Closely related to this is the form of self-feeling which we call ignorance. Children may suffer much from a depressing consciousness of their want of knowledge, more especially, perhaps, when they listen to older people's talk and try to make out what it is all about.

PLEASURE OF GAINING KNOWLEDGE. The attainment of knowledge would bring a *negative pleasure* by the removal of a painful sense of ignorance and of perplexity; and this grateful feeling of intellectual relief does undoubtedly enter into a large part of the agreeable extension of the range of our ideas. At the same time the enjoyment of study receives its chief nutriment from certain *positive pleasures, viz.*, the agreeable feelings which accompany the successful pursuit of knowledge.

As was pointed out above, all intellectual activity, provided it is not carried to the point of fatigue, has its well-marked pleasure-tone. The several forms of intellectual activity, moreover, have their characteristic feeling-accompaniments. Thus there is a gratification in contrasting objects, and in detecting the finer shades of difference among things, a gratification which is an ingredient in the pleasures of criticism, and of witty conversation. On the other hand, the bringing together under some aspect of similarity of two things which have hitherto lain remote one from another, relegated to widely dissimilar categories, contributes a still more vivid form of gratification. The mind experiences a delightful exhilaration and a new sense of power in thus linking together ideas which look foreign one to the other. Scientific comparison and classification, and

poetic simile give us this pleasurable excitement. Children show us how they enjoy this bringing together of apparently unlike things in the fanciful analogies which they themselves trace in things, as in calling the eye-lid an "eye curtain," and so forth.

The full enjoyment of intellectual activity is known in those more extended processes which enter into a busy searching for some needed knowledge. A comparatively passive reception of a new piece of knowledge, from the lips, say, of a parent or a teacher, even when something of the pains of ignorance has preceded, yields far less delight than the active discovery of it by the child's own mind. In this latter case the full activity of the mind is awakened, consciousness is intensified by the rapid passage of trains of ideas, and there is the glow of intellectual excitement. In addition to this there is an enjoyment analogous to that of the hunter, that of *intellectual pursuit.* In this active quest of knowledge a certain amount of difficulty and delay is helpful, partly by spurring the intellect to livelier exertions, partly by adding the augmentative effect of contrast and relief. As success is neared there is added the joyous feeling of triumph over difficulties.

Finally, as pointed out above, the progressive mastery of ideas is accompanied by a pleasurable consciousness of expansion and growing power. The learner feels his mind enlarged and strengthened by his new acquisition. His self-confidence rises as he feels more abreast of the world. Not only so, where the new knowledge is fully assimilated it gives the mind a firmer hold on previous acquisitions. This applies pre-eminently to the mastery of general conceptions and truths which, as we have

seen, may throw an important light on a multitude of facts only dimly understood before.

Growth of Intellectual Feelings: Children's Curiosity. The delight accompanying the pursuit and assimilation of knowledge, which we have just analysed, is the result of a long process of growth. A child shows, as we shall see presently, the germ of a love of new ideas and of truth. Yet, owing to the want of experience and a fund of ideas for assimilating new knowledge, he is liable to suffer from the pangs of ignorance rather than to enter into the fuller processes of enjoyment just described.

As already implied, the situation of children among their new surroundings renders them highly susceptible to the effects of wonder and curiosity. Professor Preyer says he noted the first distinct manifestation of astonishment in his child (on his father's re-entering a railway carriage after an interval of absence) in the twenty-second week. As the child grows, and experience begins to set up a sort of standard of the customary, this wonder at the new and strange takes on more of an intellectual or inquiring character. Lastly, when language comes to be understood and others' wider experience and riper thought begin to be brought before the child's mind, the development of this wondering inquiry is greatly accelerated.

In much of this childish eagerness to get knowledge about his new world there is something impressive, something which might well put to shame the majority of adults. Children's inquiries are often refreshing from the fact that they have not yet grown indifferent to the many problems which surround us, and that they are not restrained by our conventional limitations. To this

may be added that in their case the narrowing influence of life, with its special and dominant interests, has not yet confined the spirit of inquiry within a narrow circle of ideas.

Much of this early curiosity is no doubt fitful and fugitive enough. The feeling of ignorance is not fully excited, and the desire to know is not sustained by a sufficient fund of previous knowledge about the particular subject. Hence the further experience of parents that the young inquirer has often forgotten his question before the answer is given, wandering off to fresh fields of inquiry.[1]

A real feeling of inquisitiveness sufficient to sustain a prolonged act of attention must be supported by some *special fund of interest*, which again involves the beginnings at least of those groupings of ideas by help of which the mind "apperceives" the new. These preferential lines of intellectual interest develop themselves gradually, in the case of the individual as of the race, out of practical and personal interests, and are aided by simple æsthetic preferences, *e.g.*, for flowers or shells (compare above, p. 148 ff.).

As the fund of knowledge about this and that order of facts begins to grow fuller, the spirit of inquiry becomes more intelligent. The questioning grows more *pertinent*, and the supply of new knowledge is seen to bring a more genuine intellectual satisfaction. The same enlargement of groups of ideas enables the child to follow

[1] Compare above what was said about children's questionings (p. 399). It is interesting to note that savages are apt to grow tired of examining new things, exclaiming, "What is it after all?" See Lubbock's *Origin of Civilisation*, p. 516.

out processes of thought, and so to realise something of the student's delight in the successful search after truth.

It is to be noted that the growth of the intellectual feelings includes both the *deepening* of a special interest in this and that particular subject, and, further, the *widening* of intellectual interests so as to embrace a larger range of subjects. These two directions of development are in a measure distinct and even opposed. Absorption in special lines of study has often proved fatal to a large spirit of inquiry.

THE CULTIVATION OF THE INTELLECTUAL FEELINGS. In seeking to develop the intellectual feelings and interests the educator has, as elsewhere, to follow in its main features the order of nature. It is vain, for example, to look at first for a keen and absorbing interest in any portion of the field of knowledge. The young are, as we have seen, unable to realise all the pleasure of intellectual activity, and they cannot at first fully appreciate its practical utility. Hence adventitious aids may now and again have to be resorted to. Here the principle of association can be made use of, and the liking for intellectual pursuits encouraged by making all its accompaniments as agreeable as possible. As pointed out above, much may be done too by way of sympathy, by showing ourselves to be deeply interested in the facts and ideas we present, and so arousing a responsive feeling in the child.

While, however, these are important subordinate aids to the developing of the intellectual feelings, they ought not to be relied on exclusively. The true business of the instructor is, after all, so to select and arrange his knowledge-material as to bring it into an interesting relation

with his pupils' minds. In order to do this efficiently he must, it is evident, know something about the common characteristics of children's curiosity, and of those funds of ideas which serve as the basis of intellectual interest. He needs further to know the differences of experience and of preferential interest among his pupils.

Starting with this knowledge, his aim will be to *consolidate interest* by attaching it to definite and stable groups of ideas. In this way, for example, he will seek to concentrate his pupils' interest on the facts of the natural world, on the history of their country and so forth, so as to give a permanent *set* of curiosity in the direction of further knowledge respecting these subjects. In thus aiming at the development of special lines of interest, however, he should be on his guard lest his work end in *narrowness* of interest. The child's far-ranging curiosity is a thing to be respected, and we are but poor teachers if we do not aim at preserving and deepening in the minds of our pupils a feeling of the intrinsic value of all kinds of knowledge, and the desire to acquire illuminative ideas respecting all parts of the great dark region of the unknown.[1]

(B) THE ÆSTHETIC SENTIMENT.

The second of the three sentiments which in their fully developed form connect themselves with an abstract idea is known as the Æsthetic Emotion. It is frequently spoken of as a Feeling for the Beautiful, and also as Taste. It is a name which specially marks off

[1] On the formation of consolidated interests about *concentration centres*, and the awakening of many-sided interests, see Felkin's *Introduction to Herbart's Science and Practice of Education*, chap. iii.

one large domain of our emotional experience, *viz.*, that group of pleasurable states which arises from the contemplation and enjoyment of beauty in its widest sense, whether in natural objects or works of art. To these agreeable emotional states there correspond the disagreeable ones which are excited by what is ugly and conflicts with good taste.

Characteristics of Æsthetic Pleasure. Keeping in the main to the pleasurable side of these experiences, we may note that in every case they come to us by way of presentations of the two higher senses, Sight and Hearing. The pleasure, if truly æsthetic, is immediately connected with the perception of some agreeable feature or quality in the object, such as the brilliance of a colour, or the lovely curves of a statue.

The æsthetic enjoyments rank high among our pleasures. They contrast with the lower pleasures of sense and appetite in their refinement and purity. They are, like play, a surplus, so to speak, over the daily satisfactions which come to us in connection with the necessary work of life.

Another characteristic of these æsthetic enjoyments is that they are eminently social gratifications. Numbers of people may together enjoy a beautiful picture or a piece of music, and the pleasure of each be greatly increased by interchanges of sympathy. The essentially social character of æsthetic admiration is seen in the fact that a child will call the mother's attention to what is pretty and gives it pleasure.

The æsthetic emotion is a highly complex state made up of a number of sense-elements and imaginative processes, together with the discernment of certain relations of fit-

ness and harmony among these, all of which have a markedly pleasurable feeling-tone. A word or two may be said about these several ingredients.

(1) To begin with, then, the sensations of the two higher senses contribute pleasurable material to æsthetic perception. Those colours, form-elements, and tones have æsthetic value which supply the most perfect and so the most agreeable stimulation of the sense-organ concerned. The pleasure of bright colour, or of a voice with a rich timbre, illustrates this sensuous element. (2) Æsthetic gratification proper is something more than agreeable sensation: it implies an act of *perception*,[1] and more particularly an apprehension of certain pleasing relations among various parts of this sensuous material, and of a variety of pleasing details so arranged as to compose a whole which itself is pleasing. Thus æsthetic perception appreciates the relations of contrast and harmony among colours in a fine painting, apprehending them as parts of an agreeable colour-scheme. In like manner it discerns and appreciates those relations among elements of form which we call symmetry, proportion and so forth, as also the relations of time-elements, rhythm and measure, which enter into music and poetry. (3) While æsthetic emotion thus takes its rise in sense-presentations and their relations, it is always enriched to some extent from representative or imaginative sources. Much of the charm of natural things, such as the sweet modesty of a wayside flower, the gladsome movement of a stream, and the pathetic aspect of a ruin, depends on an imaginative process, and the fine arts, more especi-

[1] The word æsthetic (from Greek *αἰσθησις*) primarily refers to a sense-perception.

ally literature, make ample use of the pleasures of imagination.[1]

In the case of art-enjoyment one relation is of very peculiar value, *viz.*, that of truth of artistic representation to nature. The imitative arts, more particularly painting, dramatic spectacle, and poetry, aim at presenting some phase of nature or of human life by the medium of artistic semblance, and the resulting enjoyment arises in part from a recognition of its verisimilitude. Here æsthetic pleasure connects itself with the properly intellectual gratification of apprehending truth.

Æsthetic Judgment: Taste. In describing our æsthetic experience we speak almost indifferently of *perceiving* or of *feeling* the beauty of an object. This use of language suggests how closely the emotional state is here connected with an intellectual process. The use of the word "appreciate" points still more clearly to the fact of this double side of our æsthetic experience.

The appreciation of beauty in things develops by certain stages. (*a*) The first kind of appreciation is largely emotional, and so subjective or individual. A child will say that a colour is pretty or "nice," merely because it pleases *him*. Here individual feeling is the sole ground of the qualification of the object. (*b*) A second and higher stage is reached when a child begins to recognise sources of *common* æsthetic enjoyment in objects, and calls a thing "pretty" or "beautiful" because he recognises in it an *objective value*, *i.e.*, a value for others as well as for himself. This is a true æsthetic judgment. (*c*) A still higher stage is reached when analysis and comparison

[1] The reader should compare this with what was said above (p. 279 f.) in describing the process of imagination.

have detected the qualities and aspects of objects which render them objects of agreeable contemplation. Here we have a reasoned or *rational judgment* which can take the form: "This thing is beautiful (*i.e.*, objectively, for all alike) *because* it presents such and such aspects and relations".

STANDARD OF TASTE. The sphere of taste is proverbially uncertain. Individuals and communities differ widely in their æsthetic preferences, and their æsthetic appreciations are as a result apt to be limited and subjective. A wider study of what different men have pronounced beautiful, and analytical reflection on this, lead us to recognise certain universal *laws of taste* which hold good for all normal men. Such principles supply a *standard of taste* by help of which the individual may regulate his appreciations, and reach rational æsthetic judgments.

By help of this standard we are able to distinguish first of all between right and wrong, normal and abnormal, taste. Taste is wrong or unsound when it implies a considerable deviation from the normal type of human sensibility, and so sins against a law of taste. The preference for distinctly bad combinations of colour, *e.g.*, scarlet and rose red, is æsthetically wrong: so on the other hand is a liking, real or affected, for dingy colours, coupled with a dislike of bright ones.

From this normal rightness or *soundness* of taste we may distinguish *refinement* or discriminative delicacy. A child's taste for colours and sounds may be normal, and so in a sense "right," yet represent only a very "low stage" of æsthetic culture. What is called "good" in contradistinction to "bad" taste appears to include both normal soundness and refinement.

Growth of Æsthetic Faculty. The feeling for beauty in its higher and more refined form is a late attainment for the individual as for the race, presupposing as it does an advanced stage of intellectual and emotional culture. At the beginning of life we have the stage of subjective appreciation, in which there is no clear separation of what is objectively beautiful from what is simply pleasing to the individual. As in the history of the race, so in that of the individual, the appreciative discernment of beauty slowly emerges out of an unreflective sense of the agreeable, and while thus rising above a mere sense of enjoyable impressions it becomes slowly differentiated from a sense of what is personally *useful*.

With respect to the qualities in things which first awaken pleasurable sense-impressions, bright colours and sweet sounds, when not too loud, are among the first. Preyer says that his boy seemed pleasurably excited at the sight of a rose-red curtain at the early age of twenty-three days. In the case of another child a fondness for a gilded and coloured card was clearly displayed at the age of seven weeks. The effect of bright colour is increased when the object is moving, since movement introduces *change* of stimulation, and so is more exciting. Musical sounds, when not disconcerting by reason of their strength, may give pleasure to an infant as early as on the twenty-ninth day.[1] The rhythmic sequence of sounds gives pleasure certainly in the second half of the first year, calling forth corresponding movements.

This feeling for orderly sequence in sounds is probably the first dim manifestation of an æsthetic perception

[1] See Miss Shinn, *The Development of a Child*, ii., p. 115.

of relations. It is a long way from this to the perception of tone-relations or "tune". The appreciation of colour-relations, and of the space-relations of symmetry and proportion, appears later also, involving, as it does, the ability to compare. Speaking generally, one may say that in this early contemplation of objects children are wont to concentrate their attention on some impressive detail, and are unable to see the æsthetic whole as such. This applies more particularly to complex groups of objects, *e.g.*, natural scenes, which children cannot appreciate in their æsthetic *ensemble.*

Lastly, it may be observed that the appreciation of the suggestions and the ideal significance of things is only possible when experiences have multiplied and the representative powers have grown in strength. The child does not feel the pathos of the ruined castle or the sublimity of the mountain peak, because experience and thought have not yet invested these objects with their rich suggestiveness for the imagination.

Development of taste means the growth of a more refined feeling for the sensuous material, as well as of the intellectual activities carried out on this. Thus as a child's colour-sensibility develops he appreciates and enjoys less striking and obtrusive effects of colour. Similarly as his powers of observation and analysis develop he begins to discern the more subtle and complex relations of colour, form, and rhythm. In like manner as his experience and knowledge increase, and his emotional life gains in depth and complexity, the æsthetically valuable suggestions of things grow in richness. A flower, for example, will acquire a deeper charm as the mind comes to understand its delicate structure and its short, fragile life,

when it takes its place in our representation of happy country life, and when under the guidance of the poet we learn its higher, spiritual significance.

With this development of taste on the passive or appreciative side, is closely connected the development of the active impulse of the artist. This impulse has a triple root in the love of activity, of imitating and producing semblances of things, and of bodying forth pleasing or interesting ideas. It is among the oldest known characteristics of our race, and becomes active very early in the life of the individual. Children when only a year old will show a germ of something akin to artistic activity. Thus they will enter into the spirit of a little make-believe play or dramatic performance, and will fashion or arrange things with their tiny hands, as if to form a pleasing product. The whole of children's play, indeed, is closely related to art-production. As their powers of execution and their tastes progress, they derive a greater enjoyment from this plastic activity, and are able to judge better of the æsthetic value of its products. The active production of what is symmetrical, pretty, and so forth, is well known to react powerfully on the appreciation of art products generally.

As implied in what was said above, a child's judgment in matters of taste gradually acquires clearness and precision under the influence of experience and education. His first crude attempt to form an objective standard (*i.e.*, something beyond his subjective likings) is commonly a mere imitation of what is said by others, more particularly his mother. That is to say, the æsthetic judgment, like other forms of judgment, is at first *a reflection of the external authority under which the child*

lives. Thus he hears certain colours, tunes and so forth called "pretty" and imitates what is said. As, however, taste develops and judgment strengthens he shows a tendency to form independent opinions, to assert his own view against that of others, and so to give clearer expression to his individuality. Children differ greatly in respect of this capability of developing individual æsthetic appreciations.

THE EDUCATION OF TASTE. As already pointed out, the education of the feelings may be said to culminate in the development of taste. Æsthetic culture owes its educational importance to the fact that by refining the feelings, detaching them from personal concerns and connecting them with objects of common or universal appreciation, it greatly widens and elevates the child's sources of happiness.

The development of taste implies, in the case of average children at least, the existence of favourable external conditions, including what may be called an æsthetic atmosphere in the home, and the educative action of the cultivated taste of older persons.

To begin with, since the æsthetic faculty, like the other faculties, grows by exercise on suitable material, it is important to surround the child from the first with what is pretty, attractive and tasteful, so as to set up a *standard* of good taste.[1] In developing the taste, as also the other faculties, we should remember that it is first impressions which produce the deepest and most lasting

[1] See the celebrated passage in Plato's *Republic* (iii., C and D) on the salutary influence of beautiful art on the minds of the youth, insensibly drawing them from earliest years into likeness and sympathy with the beautiful ideas of reason.

effect. And here it may be observed that the home, however pretty and tasteful, and however well supplied with pictures, cannot supply an adequate basis of æsthetic experience. A child, though unable to appreciate nature in her more subtle and complex aspects, can, and is indeed eager to, appreciate such simple beauties as the colours and forms of flowers, of insects and birds, and even of those beautiful objects which Mr. Ruskin gives as the example of nature's purest colouring, clouds. It is only by such early companionship with nature that the most valuable æsthetic associations can be built up.

Yet the presence of suitable surroundings does not of itself supply what we mean by æsthetic education. As we know, children may be brought up amidst the most lovely natural surroundings and not acquire an æsthetic admiration for natural scenery. It is for the mother or other educator to direct the child's attention to what is beautiful in his surroundings, and so to appeal directly to the germ of taste. Such appeals when wisely directed are often the beginning of a fuller and deeper æsthetic enjoyment. George Sand tells us that when in her fourth year she travelled into Spain with her mother, the latter used to say on coming to some new scene, "Look ! how pretty that is," and she adds : "Immediately these objects, which I should not have remarked of myself, revealed to me their beauty ".

Here much tact is needed so as not to overstep the limits of childish appreciation, and to call attention only to what a child can enjoy if he puts forth an effort of attention. Nature is full of subtle charms which the child's eye can feel when wisely guided by another eye. The mere colouring of natural objects—of a moss-grown

tree-trunk, or a running stream, for example—is a lasting feast for the cultivated eye, and a child may, even if he is not a little John Ruskin, take his modest seat at the banquet.

While the child's taste is thus being developed in the contemplation of nature's beauty, it should be further educated by habitual contact with well-selected examples of good art. The influence of a refined mother, who studies what is pleasing to the eye in the home and her own appearance and manner, may, as we know, be all-important in exciting a nascent feeling for beauty, and giving the first direction to the child's standard of taste. More than this, the child should from the first be educated in the appreciation of the simpler works of the fine arts. The pictures and picture-books of the nursery may be made to serve this purpose, and much more might be done, both in the home and the school, by way of laying the foundation in children's minds of a refined taste for music, for literature, and for dramatic spectacle.

It is an important principle that the study and appreciation of art reacts on our æsthetic perception of natural objects. In my own case it was the study of music which developed a true appreciation of the qualities of bird song. Art, by its very process of selection and isolation, brings out the beauties of nature. As Fra Lippo Lippi says in Browning's poem :—

> " . . . we're made so that we love
> First when we see them painted, things we have passed
> Perhaps a hundred times nor cared to see ".

This gives to art its pre-eminence as an instrument of æsthetic culture. The principle has, I consider, an important bearing on education.

Æsthetic training, in order to be complete, should call forth the *productive* impulses of children. And this in part because artistic skill is always a source of pure and elevating enjoyment both to the producer himself and to others; and in part because a certain degree of familiarity with the processes of artistic production is necessary to an appreciation of a work of art as the expression of the artist's idea.

In training a child great care is needed lest we hurry the process of natural and normal growth. The pedagogical impulse to correct the young mind, which is probably in excess in most parents and teachers, leads others besides little George Sand's worthy grandmother to "snub" children's ideas of what is pretty and tasteful. In the case of the average accommodating child the effect of this attempt to educate up to the grown-up's level is to induce *affectation of taste*, a half-hearted repetition of what others say. "Æsthetic jargon" is by no means unknown among children of artists and other æsthetic persons. "Nothing (remarks Jean Paul Richter) is more dangerous for art, as well as for character, than the expression of immature feeling."[1] Children should be allowed to relish the simple æsthetic enjoyments proper to their age, such as that of pictures with gay colouring, and of simple tunes with well-marked and taking rhythms.

In exercising the æsthetic judgment, the educator does well to encourage the young learner to observe, and to pronounce opinion for himself. He should recognise the fact that taste, though controlled by certain universal

[1] See his valuable remarks on the "Cultivation of the Æsthetic Sense," *Levana*, translated by Susan Wood, eighth fragment.

laws, is in the case of every individual modified by special sensibilities, and so claims a measure of freedom.

The cultivation of the æsthetic sentiment, while it requires a special course of training, connects itself with, and may in a sense enter into, other departments of education. On one side it stands in close connection with intellectual education. The feeling for what is graceful and harmonious may be developed to some extent in connection with such seemingly prosaic exercises as learning to read and to write; and by this means a certain æsthetic interest may be attached to the exercise. Training in a nicer use of the mother-tongue in vocal recitation and written composition—a sadly neglected branch of training in these days—offers a wider field for this culture. Many branches of study when fully carried out act directly on the growth of the æsthetic feelings, and owe much of their interest and value to this circumstance. This is pre-eminently true of the study of classics and of the higher languages and literatures generally. Such studies, if at all thorough and carried far enough, should develop not only a fine sense for the value of words and verbal expression, but a genuine appreciation of literature as the art which conserves for us beauties of imagination and thought in the most perfect form of expression.

On another side, the training of the æsthetic sense connects itself with moral training. It has been pointed out by writers on education that æsthetic culture, if only by serving to moderate the turbulence of natural emotion, and to enlighten it by attaching it to clear perceptions and ideas, is a valuable aid to moral culture. A child that can calmly contemplate and admire a

beautiful object is the better prepared for appreciating human actions on their moral side.

But the connection between the two departments of culture is closer than this. Without going so far as certain Greek thinkers and identifying the beautiful and the morally good, it may be safely said that an admiration for what is beautiful in human action and character includes a moral element. To thrill with admiration when reading of an exceptionally brave action or of some piece of noble self-denial implies an appreciation of its moral worth. Hence the moral importance of exercising the young in this direction of æsthetic admiration. History and literature of the best kind give to the educator ample opportunity for such exercises.

Lastly, it is worth noting that the conjoint cultivation of æsthetic and moral feeling enters into the training of the young in certain habits of conduct. This applies to the development of habits of cleanliness and neatness, of orderliness, of courtesy and good manners. These are at once matters of minor morals, and of æsthetic value as serving to beautify life.

(C) THE MORAL SENTIMENT.

We may now pass to the last of the three sentiments, that known as the Moral or Ethical Sentiment. The special variety of emotional effect referred to under this head is indicated by a variety of names, such as the feeling of Moral Obligation, of Reverence for the Moral Law, of Moral Approbation and Disapprobation. In its highest form, perhaps, the sentiment is best described as the Love of Moral Excellence or Virtue. As these names imply, it includes, like the æsthetic senti-

ment, a pleasurable and a correlative painful experience. We are pleased by the spectacle of duty performed, pained by that of duty violated.

The Moral Sentiment is clearly more restricted in range of object than the Æsthetic. It is called forth only by certain *human* manifestations, *viz.*, voluntary actions, together with the dispositions and the type of character which these actions express. The feeling attaches itself definitely to the moral side of such actions, their aspect of rightness or wrongness, moral goodness or badness. The actions which thus excite the moral sentiment may be those of another person presented externally, or our own actions examined reflectively. The term "conscience" refers especially to the self-directed variety of the feeling. In each case alike, however, the sentiment directs itself to the moral quality of the action, *which is one and the same in the case of all agents alike.*

The element which most distinctly colours and marks off from other emotional states the moral sentiment is a feeling of *obligation* or of *oughtness.* In approving an action as right we feel that it is binding on us, that we are not free to do or not to do it, as in the case of actions which are morally indifferent—*e.g.*, in following out particular individual tastes. In reacting under the form of moral feeling we acknowledge our allegiance to some authority, whether that of an external power, the voice of the community, or of some internal principle which we ourselves set up as regulative.

It is evident from this brief account of the moral sentiment that it stands in a peculiar relation to our practical life. Just as the Intellectual Sentiment is the great

prompter and sustainer of our *intellectual* activity, so is the sentiment of Duty or of Virtue the great restraining and stimulating force in the domain of *outward action* and *conduct*. The ethical value of the sentiment depends on the fact of its close organic connection with the volitional processes.

It is evident, further, that the moral sentiment is closely related to the "Social Feelings". Whatever may be the true relation between right conduct and conduct which considers and seeks to further the *general* as distinguished from the individual's own happiness, it is certain that *the moral consciousness can only develop to its normal perfection and realise its proper satisfaction by our entering into and fulfilling social relations.* The child's first dim sense of obligation arises in connection with the situation of subjection to others' authority. The higher developments of the sentiment show the same thing. The free self-subjection of the "good will" is still a recognition of others' claims, of the supremacy of the community over the individual, of the universal over the single will. Nor is this all. What we call virtuous conduct always has some reference to the happiness and welfare of others as well as of ourselves. Broad and quick sympathies and the disposition to consider others and to put ourselves in their place are the very life-principle in all the higher developments of the moral sentiment. *The moral sentiment can only fully develop in a civilised community, and concurrently with the development of the sympathies.*

While the feeling of moral disapproval and approval is throughout of one and the same tissue, it assumes a variety of forms according to the particular character of

the action which is its object, and the special concomitant feelings which it calls up. Thus in the feeling with which we condemn a lie there is a distinctly intellectual element, a painful shock of contradiction ; in the sentiment with which we denounce a piece of wanton cruelty there is an ingredient of anger ; in our condemnation of a man's action in meanly taking advantage of another there is something of contempt, and so forth.

Again, it is to be noted that there is the important difference between the relatively cool state of mind in which we barely approve of an action as right, say paying one's school bill, and the warmer, more enthusiastic state of mind in which we praise a *virtuous* act, that is, one which clearly exceeds the limits of "duty" in its more restricted and conventional sense, as for instance the handing over of a fortune to one who we consider has a stronger moral claim to it than ourselves. This feeling, as already suggested, has an æsthetic element in it, *viz.*, admiration of what is rare and lofty.

These different forms of the moral sentiment do not always co-exist in equal strength in the same individual. A tender-hearted boy may have a keen abhorrence of cruelty, and yet be sadly wanting in reverence for truth or veracity. Such individual differences point to the complexity of the moral sentiment, to the ways in which emotional temperament and the preponderance of particular emotions of a lower order affect the colouring of the sentiment. They point further to the fact that the action of the human environment and education on the moral feeling is a variable action ; some homes, schools and still larger communities serving to develop a certain type of moral sentiment, others another. The charac-

teristic *regime* of the English public school is apt, whilst encouraging certain directions of moral feeling almost to excess, to neglect other directions.

Moral Feeling and Moral Judgment. Here, as in the case of the æsthetic faculty, we may see that the emotional element is closely bound up with an intellectual process. An enlightened conscience implies not only a fine emotional susceptibility but a faculty of discerning the presence of certain qualities in actions. The full development of this intellectual process is what we call *Moral Judgment.* In order to pronounce an action to be right or wrong we must be able to recognise in it certain essential elements on the ground of which we predicate the " rightness " or the " wrongness ".

Here again we may distinguish stages in the development of the judgment. (*a*) First comes the stage of *subjective feeling,* as when a child calls another child "naughty" because he offends him in some way, as by striking him or seizing his toy. (*b*) In the second stage the child recognises the *objective* character of morality, so as to mean by " wrong " and " right" what is wrong and right for all alike. So far he carries out a true process of *moral judgment.* At the same time it is *a blind* judgment, *i.e.,* one not based on a clear detection of those characteristics in actions which make them proper objects for approval or its opposite. (*c*) The third stage implies the carrying out of a process of rational discernment, and may be called a *rational moral judgment.* Such a process is carried out, for example, when a boy comes to understand what "just" and "unjust" mean, and goes through the intellectual process of analysing a particular action, say that of an

umpire in a cricket match, so as to recognise it as unjust ("unfair").

THE MORAL STANDARD. Men's judgments as to what is right and wrong, even if they do not vary so much as those respecting what is beautiful and ugly, show great diversities. Not only are there the striking differences between the moral sentiments of different communities and ages—say of ancient Athens and modern England; within the limits of one and the same community different social groups may set up different standards of what is honest or honourable.

Yet in spite of such perplexing differences there is with the gradual evolution of societies a distinct tendency towards convergence of moral judgment—on all the important essentials of duty at least. That is to say, men as they become more perfectly socialised and more intelligent come to agree more and more closely as to what constitutes moral goodness and badness.

The moral judgment of an individual only becomes sound or valid in proportion as he corrects his own first narrow and prejudiced views by a reference to the larger and universal view, substituting for the traditional and accidental standard of his home, or of his particular set, the standard agreed upon by the wisest and the best.

GROWTH OF THE MORAL SENTIMENT. A good deal of not very profitable discussion has been carried on as to whether the moral faculty is innate or "instinctive," or whether, on the other hand, it is the result of experience and education. The probability is that it is both the one and the other. That is to say, children have certain "natural tendencies" which certainly favour the development of a moral feeling, yet, on the other hand, only

attain a complete moral sentiment under the action of "social experience," that is experience of social life and education.

Among the congenital tendencies which appear to take part in the process of moral growth and which serve as a basis for the work of moral education, I should include first of all *the susceptibility to the commanding influence of personality*. A germ of this tendency is seen probably in the first months of life in the checking of crying or some mischievous action by the mother's firm repressive utterance. This impulse is closely akin to the early forms of the fear-reaction (*e.g.*, the effects of loud, sudden sounds), and may be described as a variety of fear excited by a strong manifestation, in voice or gesture, of the commanding presence of the human adult.

The way in which the moral sentiment gradually develops in the case of a normal child with normal surroundings seems to be as follows. We set out with the undeniable fact that at first the child finds the restraints of nursery government more or less irksome throughout, and at times intolerable. He begins his moral education with a strong dash of the rebel in him.[1] At the same time this early government finds a certain support in the timorous and deferential attitude of the child. The experience of the unpleasant consequences attached to a breach of a command gives definite direction to this submissive attitude, and the child comes to recoil from "naughty" actions which bring trouble.

This deferential attitude towards parental government and its rules becomes modified by the development of

[1] For illustrations of the rebel attitude, see my *Studies of Childhood*, p. 267 ff.

new impulses. For one thing the growth of affection for the parent, and trust in her wisdom, temper the attitude greatly, bringing the little subject a step at least towards cordial acceptance of the commands as right. A still more potent factor is the co-operation of the impulse *to abide by the customary*, which shows itself at a certain age in normal children whose surroundings have orderliness of arrangement. Under the sway of this impulse a child will not only learn to expect the rebuke, the punishment, or on the other hand the word of commendation, but will even resent any apparent omission of what is due. This respect for custom, when it grows more intelligent, shows itself as a disposition to *universalise* rules, to apply moral epithets, "naughty," "good," to other children, and even grown-ups.[1]

Even now, however, the feeling of the child for the rules under which he lives is very far from being an intelligent respect for the inherent quality of moral rightness. In order that it may pass into an intelligent appreciation another kind of experience is necessary, and this is supplied by the experience of social life which comes to every child who has companions.

Thrown with others from the first, a child soon finds that his comfort is affected in various ways by what they do. Another child may take one of his toys or strike him, and by causing him suffering call forth the self-protective impulse to retaliate. Or, on the contrary, the other may prove himself to be generous and share his toys with him, and by thus augmenting his happiness call forth a feeling of grateful liking. In such

[1] I have given numerous examples of this in my *Studies of Childhood*, p. 277 ff.

ways children when thrown together and left in some measure free to follow out their spontaneous lines of activity, gradually gain experience of the effects of actions which they hear called naughty or good, on their own welfare. That "right" and "wrong" acquire their deeper meaning for each of us by reference to the actions of others which affect us injuriously or otherwise seems certain. Witness the special emphasis of the child's "naughty" when addressed to another child who is offending him in some way. As Rousseau says: "The first sense of justice comes to us, not from our obligations to others, but from others' obligations to ourselves" (*Emile*, livre ii.).[1] By help of such experiences, when reflection is added, a child passes to some extent out of the stage of an unintelligent submission to moral rule to that of an intelligent approval of it.

Further experience supplemented by reflection would teach the child the important truth that right conduct is *a matter of reciprocity*, that the honest, fair, and kind behaviour of others toward himself, which he naturally desires to have, is conditional on his acting similarly towards them. In this way he would be led to attach a new importance to his own performance of actions which he has had recommended to him as good, and which, when carried out by another towards himself, he already recognises to be eminently desirable. He now begins to see that he ought to do what is right, *e.g.*, speak the truth, by dimly discerning that network of reciprocal

[1] The idea that the feeling of justice has its roots in the self-protective impulse, the impulse to resent injury to ourselves, is well brought out in J. S. Mill's analysis of the sentiment (see his *Utilitarianism*, chap. v.).

relations which binds us each to each as fellow-members of a community.

One further step must be taken in order that our little learner in the school of morals may attain to a genuine and pure repugnance to wrong as such. This step is the result of the development of the higher forms of sympathy.

To illustrate the influence of such a higher sympathy, let us suppose that a child A suffers from the angry outbursts or the greedy propensities of a second child B, and that later on he notes that other children, say C and D, also suffer in much the same way from B's attacks. If his sympathetic impulses are sufficiently keen he will be able by help of his own similar sufferings to put himself in the place of C or D, to enter into his smart of injury and his impulse of resentment towards B. Such a sympathetic realisation of injury done not to himself but to another is of the highest moral importance as helping to detach the idea of injury and wrong from the individual and to universalise it under the form "*injury to anybody*".

Of course, this result is not arrived at all at once. Children will resent a wrong done to their pet animal or their mother long before they resent it when done to a stranger. Hence, it may be observed in passing, the importance of the home and family relations as a cradle for the nursing of the sense of right and wrong in its early and feeble stage of development. The development of a wider and more impartial sentiment of right and wrong waits on that fuller development of the sympathies which has been traced out above (see p. 464 ff.).

The highest outcome of this habit of sympathetic indignation against wrongdoing is *a disinterested repugnance to one's own wrong action.* The really hard task for a child, as every intelligent mother knows, is to realise by help of a sympathetic imagination the result of his own naughtiness. It is only very slowly that he learns to put himself at the point of view of the child that he has wronged, and from this new sympathetic point of view look back on himself, the doer of the wrong, with a feeling of self-condemnation. When he has reached this achievement he may be said to have acquired a full realisation of the universal validity of moral relations. He has by the same process developed a new principle of moral *self-judgment,* which will when matured render him independent of external authority, substituting the motive of conscience for that of fear, even when this is tempered with affection.

The higher developments of the moral sentiment involve not only a deepening and quickening of the feelings, but a considerable enlightenment of the intelligence. In order to discern all the elements which give the moral complexion to an action, in order to detect the subtler distinctions between right and wrong, fine imaginative processes and delicate acts of discriminative judgment have to be carried out. Hence the familiar fact that a ripe moral faculty is rarely if ever attained in youth, or, indeed, in the first half of life.

The moral sentiment involves new elements and a new accompaniment of intellectual processes when it takes the form of an enthusiastic worship of virtue, of an aspiration towards the ideal of a perfect character. Here imagination touched with emotion is the all-important

feature. Youth is emphatically the time for the growth of such moral ideals.

THE TRAINING OF THE MORAL FACULTY. Since the moral feeling stands in a peculiarly close relation to the will, the problem of exercising and developing it is intimately connected with that of educating the will and forming the moral character. Although we have not yet reached this larger problem we may even at this stage inquire into the best means of developing the moral sentiment regarded as an emotional and intellectual product.

Inasmuch as the government of the parent or other person is the external agency that first acts upon the germ of the moral sentiment, it is evident that the work of cultivating the moral feelings should form a conspicuous feature in the plan of early education. The nature of the early nursery government, more particularly, is apt to have a decisive influence in determining the first feeble movements of the childish sense of duty. In order that any system of rule may have a beneficial moral influence and tend in the direction of moral growth, it must satisfy the requirements of a good and efficient system. What these are is a point which will be considered later on; here it may suffice to say that rules must be laid down seriously, and enforced uniformly and consistently, yet with a careful consideration of special circumstances, so as to give the child the idea of the inviolability and impartiality of the moral law.

The educative effect of any system of early government on the moral feelings will clearly depend on the spirit and temper in which it is enforced. A certain measure of calm becomes the judicial function, and a

parent or teacher who is wont to be carried away by violent passion is unfit for moral control. At the same time it will not do for the moral educator, when administering discipline, to disguise his personality under the form of a cold lifeless abstraction. He must, indeed, properly represent the august and rigorously impartial moral law, yet he may do this as a living personality that is capable of being deeply pained at the sight of wrongdoing. By so doing he may foster respect for the moral law by enlisting on his side those warmer feelings that attach themselves to a concrete personality.

The perfect infusion into the work of early moral training of the warmth of the educator's own feeling involves the constant and noiseless action of that moral atmosphere which encompasses a good personality. A child comes under the influence of this atmosphere when, for example, he begins to realise that his mother or teacher is a perfect embodiment of truthfulness, and to feel a repugnance to a lie because he feels how repugnant it is to her.

The higher kind of education, which aims at training the moral faculty in a more self-reliant form of activity, will include the habitual exercise of the sympathetic feelings and the moral judgment. In this higher department the educator has much to do in the way of directing the child's attention to the overlooked effects of his conduct. The injurious consequences of wrongdoing and the beneficent results of rightdoing ought to be made clear to him, and his sympathies developed, so that he may set himself against the one and on the side of the other. Not only so, as his mind develops he should be exercised in reflecting on the grounds of moral distinctions, in

recognising the inherent reasonableness of the requirements of the moral law. Here the daily experience obtained by a collision of individual wills should be utilised. He should be trained further in comparing different moral situations so as to acquire a certain readiness in discriminating rightness and wrongness in their manifold embodiments.

What is called moral instruction should in the first stages of education consist largely in presenting to the child's mind simple and telling examples of fulfilment or breach of duty, with a view to call forth the moral feelings as well as to exercise the moral judgment. His own circumscribed sphere of observation should little by little be supplemented by suitable readings from the page of history and of fiction. As in this way a wider variety of good and bad action comes to be known, the young learner will begin to recognise something of the far-reaching sway of the moral law over human conduct, as well as to penetrate more deeply into the meaning of moral language. Such a widening of the moral horizon is also an important factor in developing ideals of lofty virtue.

The problem of determining the exact relation of intellectual to moral culture is one which has perplexed men's minds since Socrates put forward the proposition that all virtue is a kind of knowledge. It seems clear, from what has been said above, that some enlightenment of the intelligence is essential to the growth of a clear and refined moral sense. A child cannot, for example, learn to be just without going through somewhat laborious processes of thought.

Yet while the educator has thus to exercise thought in

connection with moral instruction, he must beware lest in developing knowledge about moral distinctions he misses the more valuable result, a warm and vigorous *feeling* for what is right and wrong. This applies with especial force to those later and more formal exercises, such as learning to classify and to define the several provinces of human duty. The educator should never forget that the moral consciousness is essentially emotional and impulsive, and that any system of moral instruction must finally be tested by its effect on the feelings and the actions.

The education of a child's moral sentiment is, as we have seen, carried out to an important extent by daily association with other children in the free play of social life. Hence to surround a child with companions is not only something necessary for his fuller activity and happiness, but is an indispensable condition for a complete development of the moral consciousness. If the home, by its warmth of personal affection, its close and delicate care of the individual, is fitted to be the "cradle" of morality, the school—that is, schoolroom and playground together—with its larger community, its greater range of concerted action, its carefully formulated system of rules, is the drilling-ground where the moral faculty is exercised in an intelligent insight into what morality really means. It is as a member of this larger community that a child truly learns that right and wrong have a universal claim, just because they have their origin and their support in the needs of social life.

In order that the educative influence of the school-community on the moral consciousness of the individual members may become all that it is capable of becoming,

it must of course be throughout morally organised. This means not only that the discipline carried out by the authorities, both within and without the class-room, clearly shows itself to its subjects to be essentially a moral discipline by its fairness and its considerateness, but that the public opinion of the scholars as it freely expresses itself in the playground is morally sound. The action of the school authorities on this public opinion must in the main be indirect, for to seek to control it directly would be to rob it of much of its educative value. Yet the indirect influence on the "moral tone" of this juvenile community of a wise and good master or mistress may be a profound one. The feeling in favour of sociability, of co-operation in games, of fair play and the rest, must be a genuine childish growth, yet a growth which everywhere shows touches of a watchful, fostering hand.

Not the least valuable part of this action of the teacher on the young community is the restraining of the turbulence and excessive pressure of numbers. All crowds are in a sense irrational, and liable to go madly wrong through the mere contagion of numbers. The childish crowd is by no means an exception to the rule. The feeling of the playground, even when morally healthy, is apt to be a little excessive. Since, as we have seen, its moral value depends on the fuller experience of social life which it supplies, a certain amount of individual liberty is desirable even in the interests of moral culture, and must where necessary be insisted upon. And the teacher does well to remember that the young crowd is by no means always morally right, that the force of contagious opinion and sentiment in the play-

ground may become tyrannical by unduly oppressing the individual, and that what is morally good, and might after calm examination be seen to be so, may easily be stamped out by the masterful prejudices of numbers.

REFERENCES FOR READING.

For a fuller psychological account of the higher Sentiments the reader may consult the following: J. Sully, *The Human Mind*, vol. ii., chap. xvi.; H. Höffding, *Outlines of Psychology*, vi., C, 8 and 9.

The earlier developments of the feeling of Curiosity are dealt with by J. Sully, *Studies of Childhood*, chap. iii. ("The Questioning Age"); A. Bain, *Education as a Science*, p. 90 ff.; B. Perez, *The First Three Years of Childhood*, chap. vi., sect. 1; and G. Compayré, *L'Evolution intellectuelle et morale de l'enfant*, chap. ix. The reader of German may further consult the article "Interesse" in Rein's *Encyclop. Handbuch der Pädagogik*.

On the cultivation of a spirit of inquiry and a love of intellectual pursuits, the following will be found useful: J. Locke, *Thoughts*, § 118; H. Spencer, *Education*, chap. ii.; A. Bain, *Education as a Science*, chap. vi. (p. 177 ff.); J. Tyndall, *Lectures on Education*, lect. 5; E. Thring, *Theory and Practice of Teaching*, part i., chap. vi.; and B. Perez, *L'Education dès le Berceau*, chap. ii. The reader of German may consult further the article "Interesse" in Rein's *Encyclop. Handbuch* already referred to.

The development of Taste and the artistic impulse in children is illustrated by J. Sully, *Studies of Childhood*, chaps. ix. and x.; and B. Perez, *L'Education intellectuelle*, chap. ix.

On the cultivation of the Æsthetic Faculty the student may consult the following: Maria Edgeworth, *Practical Education*, chap. xxii.; A. Bain, *Education as a Science*, chap. xiii.; J. S. Mill, *St. Andrew's Address* (people's edition), p. 42 ff.; Madame Necker, *L'Education Progressive*, livre v., chap. iii.; and H. Marion, *Leçons de Psychologie*, leçon xvii., sect. 2. The reader of German may also refer to Th. Waitz, *Allgem. Pädagogik*, § 19; F. Dittes, *Grundriss der Erziehungs und Unterrichtslehre*, §§ 56, 57; Bruno Meyer, *Aus der æsthetischen Pädagogik;* Konrad Lange, *Künstlerische Erziehung der deutschen Jugend* (Darmstadt, 1893); and the article "Æsthetische Bildung" in Rein's *Encyclop. Handbuch der Pädagogik*.

The early developments of Moral Feeling are dealt with by the

following: B. Perez, *First Three Years of Childhood*, chap. xiii.; G. Compayré, *L'Evolution intellectuelle et morale de l'enfant*, chaps. xiii. and xiv.; and J. Sully, *Studies of Childhood*, chaps. vii. and viii. The reader of German may also consult G. F. Pfisterer, *Pädagog. Psychologie*, §§ 16, 18.

On the cultivation of Moral Feeling and Judgment the following will be found useful: H. Spencer, *Education*, chap. iii.; A. Bain, *Education as a Science*, chap. iii. (p. 100 ff.), and chap. xii.; Madame Necker, *L'Education Progressive*, livre iii., chap. vi.; B. Perez, *L'Education dès le Berceau*, chap. vii., sects. 2 to 5; G. Compayré, *Cours de Pédagogie*, part i., leçon x.; and H. Marion, *Leçons de Psychologie*, leçon xvii., sects. 3 and 4. The reader of German may further consult F. E. Beneke, *Erziehungs und Unterrichtslehre*, §§ 47-55; Th. Waitz, *Allgem. Pädagogik*, § 14; F. Dittes, *Grundriss*, §§ 58-62; and the article "Gewissen und Gewissensbildung" in Rein's *Encyclop. Handbuch der Pädagogik*.

PART IV.

DEVELOPMENT OF THE WILL AND CHARACTER.

CHAPTER XIX.

THE CONATIVE FUNCTION: DEVELOPMENT OF VOLUNTARY MOVEMENT.

Having now investigated the working of the affective function and traced out the course of development of the life of feeling, we may pass on to the consideration of the third function of our mental life, *viz.*, the Conative or striving function, which in its higher development becomes what we call a volitional process, or "willing" (compare above, chap. iv., p. 46).

Definition of Conation. By the term Conation we seek to mark off what is in a peculiar sense the *active* phase of our mental life. We are "active" in this sense when we consciously exercise our limbs, as in lifting a heavy weight. Conation does not, however, always issue in muscular action. We are active and conative so far as we have an *impulse* to do something. Conation when developed becomes the volitional process, or *willing* to do something. It is the work of the psychologist to show how such volitional processes arise out of the germinal forms of Conation manifested at the beginning of life.

Origin of Voluntary Movement: (*a*) Congenital Factor. In seeking to follow the development of the conative process we shall do well to start with the problem of voluntary movement. By this is meant a muscular movement which is consciously directed to the gaining of some end, or which is accompanied by "psychical purpose" (see above, chap. vi., p. 127). A child carries out a voluntary movement when he holds out his hand to take something which is offered him.

These movements do not appear at the beginning of life, but are acquired by help of experience. Before a child can carry out intelligently any movement in order to gratify a wish or desire, he must have had some experience of that which he desires so as to be able to *represent* it, and also some previous experience of the relation of antecedent and consequent between the movement he carries out and the realisation of his desire. We have now to ask how such simple actions are developed.

In reviewing the elements of our psychical life (chap. vi.) we have seen that a child carries out a number of movements of a non-voluntary character. Some of these, *e.g.*, Reflex Movements, are of but little interest as contributing elements to voluntary movements; others, again, are of the greatest importance. This applies to Instinctive Movements, in the comprehensive sense of this term defined above (p. 128).

The characteristic of these instinctive movements is that they are *feeling-prompted*. A child carrying out the movements of sucking under the stimulus of hunger illustrates this characteristic. A feeling of distress and of want here generates an *impulse* to movement, and

the movement, in the degree of its vigour, reflects the intensity of the feeling.

There is reason to believe that, as the result of congenital nervous connections, all feeling directly excites movement, its range and its energy varying with the intensity of the feeling. A child when affected by pleasurable feeling will move the limbs and the vocal apparatus. Still more marked is this disposition to movement in the case of painful experiences. A child, suffering from the pains of indigestion, or what not, is apt to move his head and arms, to wriggle his body, and to carry out other movements which indicate a state of *discontent* and a vague sense of want or *craving for something.*

(*b*) Effects of Experience. When movements thus arise during a markedly pleasurable or painful state some of them are pretty certain to have an effect on the feeling-tone. A child carried away by a feeling of delight may by a movement lose the source of his delight, *e.g.*, in letting drop some pretty bauble. On the other hand the movement may tend to intensify, or at least to prolong, the enjoyment, as when the pleasure of the bath is furthered by the plashing movements of the arms and hands. Similarly with respect to painful states. When for example a child is lying in an uncomfortable position, a wriggling movement of the body may make matters worse, but is much more likely to make them better. Any changes of this kind, just because they affect feeling, are interesting and so are likely to attract attention and to be remembered. When they occur again and again the connection between the particular movement and the result in change of feeling-tone would (according to the

law of contiguous association) be fixed in the mind. In this way a child would gradually obtain *a stock of experiences respecting the effects of his own movements on his comfort and discomfort.*

We may now go a step further. A child, like all sentient creatures, is so constituted as to seek what is pleasurable and beneficial, and to avoid what is painful and hurtful. When, therefore, he reaches the age at which he can represent some beneficial change, say the removal of the disagreeable sensation of chilliness by contact with the mother's body, and can also represent the movement by which this change can be brought about, *viz.*, cuddling to his mother, his natural impulse to seek what is agreeable or beneficial will prompt him to give effect to the idea, that is to realise it as actual movement.

We may say, then, that the simplest form of voluntary movement arises *by a selection of a useful, that is a beneficial, movement from the field of non-voluntary movement.* This simple variety of voluntary movement first appears, according to Preyer, after the completion of the first three months. The process of selection of movement here described is greatly aided by special instinctive dispositions. Thus the act of stretching out the hand and seizing an object, though it requires to be learned by practice, is, as Preyer has shown, aided by congenital elements. The same is true of walking and other movements.

THE FACTORS IN VOLUNTARY ACTION: (*a*) DESIRE. If we analyse one of these apparently simple voluntary movements we find that it is a somewhat complex process. Let us take an example: A child has had again

and again the agreeable experience of listening to the ticking of your watch. The next time you take out your watch he proceeds to open it and place it near his ear in order to renew the experience.

Here the first stage is the excitation by the sight of the watch of a certain *desire*, *viz.*, to hold the watch and hear the ticking. All movements which can be called voluntary actions involve this element of desire for something. The "object of desire" may be described as the possession of that which we find ourselves without, or better, as some change from a worse to a better condition. Although growing out of feeling and closely connected with it, desire is marked off from passive feeling by the characteristic of *active tension*. To desire that which we do not possess is to be mentally reaching out for the object.

Desire is clearly related to that restless craving which appears in instinctive movement. In this last, however, though there is craving there is no definite representation of what is needed. The word *Appetite*, in contradistinction to Desire, brings out the difference. The bodily appetites are at the outset essentially blind impulses brought on by certain organic sensations. They work independently of experience and are necessary for the preservation of life. After experience is added the first blind craving gives place to a more definite longing. That is to say, the experienced child when hungry is no longer impelled merely by organic appetite but *by a representation of the pleasures of satisfying hunger.* At this stage desire, properly so called, is added to appetite.

It follows that desire or definite longing for something

with its distinct mental representation is the result of experience. It is the product of experience of what is agreeable working on the natural disposition of the child to activity. The experience of the disagreeable works on this disposition also, but by exciting the opposite attitude of *aversion*, or desire to get rid of, or to avoid, what is unpleasant.

(*b*) Idea of Suitable Action: Motor Representation. Desire, though necessary to a voluntary act, does not of itself produce such an act. Before it becomes effective for this purpose *the representation of the agreeable change of condition must be coupled with, and so able to suggest, the representation of an appropiate movement, or combination of movements.* In the case given above it would be vain for the child to desire to hear the ticking of the watch if experience had not further equipped him with a knowledge of the means of satisfying his desire.

With respect to this second element in the simple form of conative process here described, little needs to be added to what was said in an earlier chapter. Our movements form a special class of presentations, to which corresponds a special variety of representations or images (compare above, p. 117 ff., and p. 241). It may be added that in imagining a movement, say that of advancing the right arm, we commonly represent not merely the muscular experience attending the movement, but its immediate *visual* result, *viz.*, the appearance in the field of vision of the moving arm.

(*c*) Attention and Voluntary Movement. As has been implied in this account of voluntary movement, selective attention is an essential part of the process.

It is only because in the state of desire attention is fixed on the idea of the desired change, and on the appropriate motor representation, that these acquire the stability and the force necessary for bringing about the movement.

We have seen that all attention, just because it is concentrative, is *restrictive*, that it shuts out or cuts off irrelevant presentations and ideas. This restrictive effect is very clearly marked in the case of movements. In order to carry out a movement precisely and nicely all interfering movements must be suppressed or *inhibited*. Thus in learning to point with the index finger a child has to suppress the movements of the other fingers which are apt to accompany it.

It may be added that the full representation of a movement as described above rarely occurs save in the stage of learning to perform movements. We do not first distinctly represent a movement and then act, but the representative part of the process gets slurred over, so to speak, becoming merged in the experience of actually performing the movement.

The effect of desire, when thus guided by the representation of a suitable action, and concentrated on this by means of selective attention, is to start the physiological process in the motor nerves which issues in the contraction of the muscles. This actual carrying out of the movement becomes in its turn a new experience: after desiring and aiming at a result we become conscious actors or *agents*. When viewed in relation to this realised action the desire is spoken of as the cause or *motive*; and the result, so far as represented and aimed at, as the *end*.[1]

[1] The word "end" (Greek τελος) means here not merely that which comes last in order of time, but that of which the idea determines the movement and makes it an intelligible action.

We will now trace out the further development of the process involved in voluntary movement. In the present chapter we shall be mainly concerned with the gradual extension and mastery of the field of movement. The growth of the initial element of desire or motive will be traced out in the following chapter.

Improvement of Movement by Exercise. The perfect carrying out of any voluntary movement is the result of a series of trials and progressive advances. This applies to movements so early acquired as seizing an object with the hand. Professor Preyer has shown that this simple-looking action was only acquired by his boy in the seventeenth week after a series of gradual advances.[1] We see the same thing in the later acquisitions: witness the awkward attempts which preface and lead up to the movements of writing, drill-exercises, and the like. In this process of gradual self-improvement, we have to suppose that each stage reached supplies to the next stage new and more fitting modifications of motor representations.

Progress in gaining command of the organs of movement depends very much on the inventiveness shown by the child in re-adapting acquired movements to new purposes. Throughout this progressive extension of the range of movement there is a double process of separation or isolation and of combination. As pointed out above, the voluntary execution of a movement implies the inhibition of other motor tendencies active at the time. The learning to perform such a simple-looking movement as pointing with the fore-finger implies a

[1] See his excellent account of the development of this movement, *The Senses and the Will*, p. 241 ff.

somewhat difficult process of isolating the extension of this finger from that of the other fingers. We see the same thing in later acquisitions. In learning to write, a child has to check a tendency to other concomitant movements, such as those of the head, legs, and tongue.

Not only so, in learning new complex movements old associations of motor elements have to be broken through. Many manual movements, *e.g.*, that of wringing out a towel, involve a dissolution of previous customary combinations. The same thing is illustrated in well-known movements of the fingers and two hands needed for piano-playing.

On the other hand, all progress in movement involves the ability to put together motor elements in new combinations, that is, to *construct* motor representations. Such simple actions as carrying an object to the mouth are acquired by combining the grasping or holding movement of the fingers with the carrying movement of the arm. A specially interesting case of such combination occurs when the infant carries out simultaneously a different movement with each hand, as in holding a ring to the mouth with one hand and plucking a man's beard with the other.[1] Similarly in learning the later movements of writing, a child has to hold the pen in a certain way, and to combine a relatively fixed position of the fingers with the necessary movements of arm, hand, and fingers. All new exercises, such as those of school-drill, of skating, bicycling, and so forth, imply a like constructive activity in co-ordinating motor elements in new arrangements (compare above, p. 277 f.).

[1] Carried out by one child in the thirty-third week (see K. C. Moore, *Mental Development of a Child*, p. 17).

IMITATION, ETC. The term imitation is popularly used for the copying of any mental trait from another, whether a manner of feeling, of thinking, or of acting. In its narrower scientific sense the term refers especially to movements. By an imitative movement is meant one which is called forth in us by the presentation of a like movement as performed by another. Thus it is an imitative action when a child pouts on seeing his nurse pout. The common mode of presentation in imitative movement is visual: we imitate others' movements when we see them carried out. In the case of certain imitations, especially vocal, the visual element, though present (the child observes the movements of the mother's lips, etc.), is greatly aided by the auditory effect of the movement.

The first attempts at imitative movement, *e.g.*, pursing of the mouth or pouting, begin, according to Darwin and Preyer, about the age of four months. It is not, however, till towards the last quarter of the first year that imitative movements become well marked and frequent. From this time onwards imitation is apt to become a sort of craze with children. They imitate gestures, *e.g.*, the "good-bye" movement of the hand, and any movements which produce a lively effect, such as rattling a bunch of keys. Later on, in the second year, when the speech-organs develop, imitation of vocal sounds plays a prominent part in child-life. Other interesting imitations observable in the second and third years are those of the manual movements of older persons in writing, drawing, and so forth.

Along with these responses to the presentations of others' movements there begin to occur imitative repro-

ductions of these *after* they have been presented. Child's play is full of such reminiscent imitation of what others have been seen to do and heard to say.

It follows that imitative movements are not instinctive, but have to be learned. A child is only able to imitate another's movement after he has acquired from the sources already referred to a certain range of motor experience, and has firmly associated the visual aspect of a movement with the muscular experience. This connection is of course formed in the first instance by watching the visual appearance of his own movements. He then transfers this association to the similar appearances which present themselves when another person moves. In this way the sight of another person waving the hand calls up the motor representation of a similar movement on his own part, and thus he is prompted to carry out this movement.

As suggested above, imitation has little if anything of a purposive character. This is illustrated in such actions as yawning or coughing on seeing or hearing another carry out the action.[1] At the same time it is to be noted that a child will only imitate *certain* actions, presumably those which specially interest him because they are carried out by certain persons, or are odd, or lead to interesting results. It seems probable that children enjoy using their organs of movement and showing their newly acquired powers. In a good deal of childish imitation there is the further pleasure of finding out how a thing is done. So far as the love of

[1] Numerous examples of children's imitations are given in *Imitation and Allied Activities*, edited by Miss E. M. Haskell (Heath & Co., 1896).

activity or curiosity prompts the action it takes on the character of a voluntary act.

Later on the early type of impulsive or non-voluntary imitation tends to become more definitely a voluntary process. A boy of six or eight will copy the actions of another under the influence of a conscious *desire to imitate*. The prompting motive at work here is not always the same. When a boy imitates the bodily feats of another boy he is impelled by the wish to display his powers, and to show himself equal or superior to another, *i.e.*, by the motive of ambition and rivalry. In other cases the impulse to imitate springs rather out of the social feelings, affection and admiration for some superior, such as the parent or teacher.

From this brief account of imitation we can more clearly discern the connection between it and sympathy. The latter as we saw begins with a kind of contagious transmission of the external bodily manifestations of an emotional state, *e.g.*, those of hilarity or grief. Here imitation of bodily attitude, gesture, intonation of voice, and so forth is the starting-point, and helps to set up the whole emotional response. It is worth noting that there is a reciprocal action of sympathy on imitation. A relation of sympathy when fully developed between two persons prompts to a mutual adoption of gestures, tricks of manner, and, by a more reflective process, lines of action.

The simplest type of imitative movement is a mere reproduction by a child of some action that he has already acquired independently, as when Preyer's child pouted in response to his father's movement. But imitation is not always of this simple reproductive pattern.

Children are wont to copy new forms of movement. Thus the infant learns to wave its hand in response to the action of the mother. This higher form of imitation not only presupposes a certain stage of motor experience, but facility in modifying this experience by the processes of separation and constructive combination already referred to. Progress in the great imitative field, that of speech, depends on these conditions.

The impulse to imitate, more especially new and as yet unlearned movements, is an important aid to the development of children's voluntary movement. By copying others, particularly older children, they widen the field of their motor action. It is further a valuable auxiliary to the learning of useful movements. A child thrown with other children who are just able to walk learns the necessary movements more quickly than a solitary child deprived of this lead.

Children vary much in the strength of the imitative impulse. This is partly connected with unequal degrees of vigour in the active organs, to be spoken of presently. A more special condition is the degree of intelligent interest taken in the visual aspects of others' bodily movements. Again, the strength of the impulse to imitate others will vary much with the emotional temperament. Children of a strongly social bent will be more interested in observing others' actions, and so more likely to imitate them. Deference to older people in authority favours imitation of what they do and say. In contradistinction to these children, others of a more self-assertive and original turn of mind are apt to strike out their own lines of action.

Somewhat similar to the aid rendered by imitation in

extending the range of movement is that rendered by responses to another's command or suggestion, or, as we may call it, *the verbal initiation of movement.* As soon as a child firmly associates with his several movements their descriptive names, as "sitting up," "putting out the right foot," and so forth, a mechanism is formed by which his movements may be initiated by another. This influence is closely analogous to that of example working upon the child's imitative impulses: it is *an augmentation of the range and the number of occasions of movement through the action on the child of social stimuli.*

FURTHER DEVELOPMENTS OF VOLUNTARY MOVEMENT. The voluntary movements thus acquired by the aid of experience and practice, supplemented by imitation and social control, undergo certain changes as the result of development. A word or two may suffice to indicate the principal directions of these changes.

To begin with, then, as development advances movement *becomes less an immediate response to the sense-presentation of the moment.* In other words it becomes more independent of present external circumstances and more internal in the mode of its initiation. This accords with the general order of mental development, from external sense to internal processes of imagination and thought (see above, p. 69).

A step in the direction of this detachment of movement from the external circumstances of the moment is taken when verbal initiation comes on the scene, for when a child carries out a simple action in response to the mother's request, the mode of initiation, though in a manner external, is no longer the product of the circum-

stances of the moment acting directly on the needs of the child. A much more important step, however, is taken in this gradual detachment when the child's motor imagination is developed, and he can readily call up the image of this and that movement independently of the particular sense-presentations of the moment. Through the acquisition of this fuller and freer imaginative activity a child becomes capable of carrying out movements and groups of movements whenever the fancy takes him, and from no stronger impulse, perhaps, than the love of activity or the wish to show another that he can do so. In their self-prompted play children show how such inward initiation of movement extends as their minds develop.

Another direction of this motor development requires to be pointed out. In the early stages motor representations play an important part. In learning to write, for example, a child has at each step to represent the next movement before carrying it out. Imitation, too, obviously involves attention to the motor part of the process. In the later stages of voluntary movement such distinct representation of movement is no longer required. *It is enough to fix attention on the image of the result of the movement.* This transition is clearly seen on learning to draw and to write. The first manual movements are carried out by help of motor representations which have to be distinctly attended to; as is seen when a child first tries to copy the movements of the mother or teacher in drawing a head, or in forming a letter. Later on, however, the child focusses his attention on the image of the visible result of his movements, *e.g.*, the oval of the head, the particular form of the

letter, and the whole process is more and more controlled by this idea of the result.

The progress made in the several stages of this acquisition of the command of the organs of movement will vary with the active disposition of the child, and with the character of his surroundings. Confining our attention for the present to the internal conditions, we may instance as among the more important: (*a*) a vigorous muscular system, with a corresponding readiness to do things, to strike out new experiments, and to persevere doggedly through a succession of trials; (*b*) a certain delicacy of the muscular sense, which favours a fine discrimination of motor presentations and representations, and so a nice execution of the several movements; and (*c*), closely connected with the last circumstance, a good retentiveness for motor presentations, which favours the association of them with the passive sense-impressions which evoke them, as also with one another in groups, and so secures the orderly reproduction of them.

To these natural aptitudes must be added a strong interest in muscular activity and its effects, which interest will favour a close concentration of mind on the several forms of motor experience. The interest may spring largely out of the child's love of muscular activity, the delight which the conscious exercise of his motor organs brings him. But the attainment of the more difficult muscular performances presupposes other interests as well, involving the love of power, and the closely related feeling of rivalry. Active natures early come under the influence of these motives.

The attainment of a large and firm command of the bodily organs is an important preliminary to the growth

of the higher volitional processes. All our actions, even the lofty moral action of a hero, are carried out by means of movements of various kinds. Not only so, the very process of acquiring this command of movement implies in a rudimentary form the higher volitional processes, and more particularly persistence in effort and trial, resolution in overcoming difficulties, and practical intelligence in comparing and choosing between alternatives. Anybody who watches an infant, even in the first year, trying to combine manual movements, so as to raise or to turn over a heavy and unmanageable object, may see how in this early and crude form of action the attributes of the higher volition begin to manifest themselves.

Movement and Habit. The term habit may, as we have seen, be used in a comprehensive sense so as to refer to all recurring modes of mental activity, as when we talk of a "habit of thought". In a narrower and more restricted sense, it refers to a principle which especially governs the domain of voluntary action (compare above, p. 32). We are said to do a thing under the influence of habit when we carry out a familiar, oft-repeated action in response to some initiating stimulus with scarcely any conscious or psychical purpose or any attention to the precise form of the action. Examples of such habitual actions are to be found in many movements of our daily life, such as walking, dressing and undressing. All such movements take on something of the mechanical or automatic character of a reflex action. This is recognised in our customary way of speaking of them as "instinctive," *i.e.*, as resembling the unacquired movements of early life.

As we have seen, every movement tends by repeated

performance to grow easier, involving less of close attention and conscious effort. This appears to mean, first of all, that as the result of repetition there is set up a "psycho-physical disposition" to perform the particular movement whenever it is suggested, and apart from any strong promptings of desire. This fixed disposition shows itself in the promptness of the motor response to the slightest stimulus which may chance to act.

In the second place, habit implies a close association between a definite motor presentation and a group of sense-presentations answering to a special situation or set of circumstances. When, for instance, a person on going to bed takes out his watch and winds it up "under the force of habit," it is the special situation—*viz.*, the act of taking the watch out of the watch-pocket, together with the visual presentation of the watch—which calls forth the movements of winding it up. Habit in its early forms is thus *a firm linking of movements to external sense-presentations.* This firm connection has for its organic base a co-ordination of the several nerve-centres, sensory and motor, which are engaged.

It is however in the case of series of movements that the force of habit is most commonly seen. It is evident that in rehearsing any familiar series, such as that of walking, of swimming, or of writing a word or a phrase, the successive movements, *e.g.*, the alternate lifting of each foot from the ground, are not individually attended to. Each member of the series when executed induces its successor, and the whole chain takes on an automatic character. Here too we certainly have to do with a physiological fact, the formation of a closely

organised series of sensory and motor impulses in the central nervous organs.

It is to be observed that in carrying out any such firmly organised series of movements a true volitional process, *viz.*, a conscious purpose, occurs, if at all, only at the outset, or when the mechanical smoothness is interrupted by a difficulty. Thus in setting out for a walk I may distinctly represent and desire the exercise, though afterwards the movements may take care of themselves save where some difficulty occurs, as in having to cross a stile.

Strength of Habit. Habits, like the contiguous associations among our passive ideas, which they closely resemble, are of very different degrees of strength.[1] The degree of perfection of a habit may be estimated by the promptness and the uniformity of the active response to stimulus. Thus the soldier's response to an order, as "Attention!" is "mechanically perfect" when it follows immediately and in every case. The strength of a habit may be estimated in other ways also. It follows from the above account of the mechanism of habit that it is a tendency to a special kind of action which is physiologically better organised than the actions which are accompanied by clear consciousness. Hence, its strength may be estimated by the difficulty of controlling and of altering it, and further by the amount of discomfort which attends its non-fulfilment. Habits which have had a long history, especially those of middle age, have these characteristics in the highest degree.

[1] The student should compare this account of habit with that given above of memory, to which it is so closely akin; see especially p. 217, and p. 223 ff.

FORMATION OF HABITS. A habit of movement may grow up automatically, that is without going through a preliminary stage of volitional acquisition. This applies to many of the "bodily habits" acquired in early life, such as the sucking of the thumb during the first months, and many little gestures and other movements induced by a semi-conscious process of imitation.[1]

Confining ourselves, however, to habits which are started by a truly volitional process, we may see from the above account that their formation implies two main conditions: (1) an initial volitional process, *viz.*, the close concentration of attention involved in learning a new movement (or group of movements); and (2) a continuous and sufficiently prolonged repetition of the movement on the recurrence of a definite set of circumstances. The excellence as a habit of the soldier's response to the "word of command" is explained by all the initial effort put into the mastering of the action, and by the long-continued and unvarying repetition involved in years of drill exercise.

In the early years habits are in the making. Owing to the plastic condition of a child's central nervous system the building up of a habit is in this period much more rapid and less costly than at any subsequent period. A more extended process of acquisition, *viz.*, a severer initial effort (or rather series of efforts), as well as a much longer course of repetition, is needed in later years to fix action in a definite direction. Not only so, since the habitual modes of movement ac-

[1] For a good account of the sucking habit, see K. C. Moore, *op. cit.*, p. 12 ff.; *cf.* M. Baldwin's account of the development of the habit of right-handedness, *op. cit.*, chap. iv.

quired in early life, like the first impressions about things, are persistent and difficult to get rid of, the formation of good habits later on is obstructed by the tenacity of the opposed early habits. A child, for example, that has been allowed to adopt an awkward way of sitting, or unpleasant tricks of manner, gives special difficulty to the educator just because of the process of disorganisation, that is, breaking up of organised combinations, which is involved.

Fixity and Plasticity of Movement: Habit and Adaptive Growth. So large a part of our ordinary daily life is a recurrence of similar circumstances and similar needs that the principle of habit exerts some influence in every direction of our activity. Thus the actions by which we care for the needs of the body, our behaviour before others, and so forth, are properly dominated by this principle. In this way, by the reduction of a difficult action to an easy automatic type, the nervous energies which are specially used up in the initial effort are economised, and mental activity left free to direct itself to other matters. So far, then, as our life-circumstances remain unaltered, and similar lines of responsive action are required from us, the working of habit is a clear gain.

At the same time human life differs from animal life in the greater degree of its complexity and variability. It has been pointed out above that the child is not furnished at the outset with an outfit of "instincts" as the lower animals are. The gradual development which the child needs in order to cope with the circumstances of human life consists in a process of successive adaptive modifications, issuing in a growing adjustment of the

individual to these circumstances. While, then, the formation of habits is an important part of growth, it is not the whole. Fixity in definite directions must not exclude plasticity and modifiability in others. The complete and absolute rule of habit marks the arrest of development.[1]

While habit, when carried to an extreme, may thus be antagonistic to development, the principle of habit, in a large sense, enters into the process of development itself. It is by perfecting an action so as to carry it out readily and with ease that more difficult actions become possible. This is illustrated in the example of habit given by Montaigne of a peasant woman, who, having accustomed herself to carry a calf, was able later on as the result of this acquisition to carry the animal when it grew to be an ox. In learning drill exercises a child is at each stage aided by a previous reduction of the elementary movements to the form of habits.

As we saw above, methods have been devised for testing the carrying out of simple movements, *e.g.*, a rapid series of taps on an electric key (p. 94). These experiments serve, it is evident, to measure the *voluntary* command of movement. When, for example, it is shown that a child cannot hold his head so steadily as an adult we must set this down to want of a perfect control of the motor organs.[2] Other tests of a similar kind can easily be added, as aiming with the index finger at a small object, drawing a straight line, repeating a new and difficult series of articulate sounds.

The Early Training of the Will through the Exercise of the Motor Organs. As already observed,

[1] Compare what was said above (p. 73), also Baldwin on "Habit and Accommodation," *Mental Development*, pp. 168, 169.

[2] See an article headed "A Preliminary Study of Motor Ability," by J. A. Hancock, in the *Ped. Seminary*, October, 1894.

the child's attainment of the command of his organs of movement is greatly promoted by the direction of others. No doubt, as Rousseau urged, a boy brought up in the country and left much to himself would develop considerable flexibility and precision of movement; yet it is equally certain that he would not reach those complex and difficult co-ordinations which are required in the civilised life of to-day, such as those of drawing and writing.

The work of training the muscular organs belongs in part to what is called Physical Education. The well-known effects of muscular exercise in promoting the general circulation of the blood and the maintenance of bodily heat give it an important place in the educator's endeavour to further the health of his pupils. The prominence assigned to the development of the muscular system by kindergarten exercises, gymnastics, and the encouragement of out-of-door games, points to the recognition of the dependence of the general health, and, along with this, of mental efficiency, on muscular development.

This physical education in its more elaborate forms, involving special practice and skill, aims at the attainment of a special bodily excellence, *viz.*, the muscular strength, quickness of movement and other qualities of the athlete, or, as it was conceived of in the old Greek training (feebly imitated in our so-called "calisthenics"), a perfect and beautiful harmony of bodily movement.

Viewed from a slightly different point of view this training of the organs of movement enters into the processes of Intellectual Education. It has long been a commonplace of the school that the proper carrying out

of the articulatory movements involved in reading aloud and of the manual movements involved in writing is an integral part of the business of learning; for reading and writing are the indispensable channels by which in a civilised community an individual mind takes in from others and gives out to others its knowledge and ideas. But the new view of the connection between manual movement and intellectual training goes far beyond this. We are coming more and more to see that in exercises such as drawing, sloÿd, and the like, which engage eye and hand in the finer processes of reciprocal adjustment, the intelligence is wholesomely exercised, that here as in the earlier kindergarten occupations the child *learns by doing*. More particularly it is coming—alas, too slowly—to be recognised that drawing is for children less a fine-art subject than one of the most effective means of developing a fine and accurate visual observation (compare above, p. 201 f.).

Another aim which this training of the organs of movement sets before itself is the development of *a general basis of useful action* and technical work. Although education has not to train in the useful arts, it has in exercising a child's hands to seek to make the fingers ready and habile, and so to supply in the shape of a general muscular skill the necessary foundation for any special line of technical training which is to follow.[1] The occupations of the kindergarten, such as paper-folding and the like, develop suppleness of finger and ease in carrying out new co-adjustments, and so form an elementary stage in the development of mus-

[1] On the value of such general skill, see Lloyd Morgan, *Psychology for Teachers*, p. 67 ff.

cular skill, and the sloÿd and other exercises of the school follow up this aim.

Finally, it is to be observed that in all these exercises of the motor organs we have to do with the child's *volitions*. Movements are in every case the product of the child's own conscious impulses, and as such are *exercises of will*. As we have seen, the early growth of volition proceeds by way of learning to command the organs of movement. It is in movement that clear purpose and intention first display themselves, and that the first experiences of obstacle and the first training in steadfastness and patience of effort are reached. All practice in doing things, then, whatever its primary object may be, is to some extent a strengthening of volitional power, and the educator does well to remember that in setting these exercises he is, or may become, a *moral* educator, developing in the young learner valuable qualities of will.

In assisting in this early stage of will-development the educator should bear in mind what Rousseau so ably emphasises, that children are strongly disposed to muscular activity, and in their self-appointed occupations and in their play show that they are capable of making real progress in the difficult art of using their motor organs without any direct assistance from parent or teacher. The young child should from the beginning have ample opportunity for freely exercising his active organs, with only a general supervision and at most the imposition of a few necessary restraints. His nursery and his playground should be so arranged as to suggest and encourage vigorous bodily movement, as well as to direct it into definite lines of exercise. The important part

played by imitation in the growth of voluntary movement suggests the advantages of companionship in this early stage of education. A child is mightily stimulated by the sight of others doing things as yet new to himself, and a little fellow of six is much more powerfully acted upon by the sight of the achievements of another boy a year older than himself than by that of any bigger performances of the adult. Companionship becomes absolutely vital in all concerted actions, such as those of many social games of the home and kindergarten. Here, not only are new pleasurable stimuli supplied to young effort, but the social nature is appealed to, and the invaluable quality, readiness and ability to co-operate with others, developed.

The regulative province of the educator in these rudimentary exercises of the will begins with showing the child how to do things. To know when to do this requires judgment. It is often better for children themselves to find out the way to do a thing, just as it is better for them to discover the reason of a fact. Nothing is more fatal to the progress of young effort than an indolent aversion from trial and experiment. Hence a mother who is given to interfering with a child's activity, pulling him up, and showing him by a model-action of her own (or, worse still, by joining her hand to his) how a thing is to be done, is losing sight of a vital condition of all development, *viz.*, self-activity.

As the child grows his actions become in one direction freer, in another more subject to the control of the educator. The parent has at an early stage to begin to drill the little savage in the proprieties of civilised life, bidding him sit at table and hold his spoon in the pre-

scribed way, articulate his words in the approved manner of educated adults, and so forth. And to this home instruction there is added later the more systematic training of the school. In the varied muscular activity of the kindergarten, the manual exercises of drawing, writing, sloÿd, and the rest, and the employment of the vocal organs in reading and singing, the teacher becomes the trainer of the child's muscular powers in various lines of orderly constructive activity.

The object to be aimed at in all such exercises is to train the child to the best possible use and management of his organs of movement. The ideally perfect action is one which is fully adequate to the purpose in hand. At the same time it follows Nature's law of economy, as this is illustrated in many self-prompted infantile actions, especially the invention of manual signs for making known wants. The educator should aim from the first at perfection in this sense, even in the apparently trifling actions of everyday life.

In developing such bodily perfections a number of conditions have to be satisfied. It may not be superfluous to remark here that the educator should reflect carefully as to what he may wisely insist upon. The task assigned, the degree of perfection exacted, must not be above the child's powers, so far as these have been developed by past exercises.

In saying this, I do not mean that the child is not to be called on to make serious efforts. The exercises can, indeed, only become a training *of the will* in so far as they are made to call forth such efforts. The child's natural inclination to abandon work which requires a long-sustained effort should be strenuously opposed and

overcome. And here an appeal to some motive other than the mere pleasure of activity will often be needed. The educator will need to awaken young ambition to do the things done by those a little in advance of him, also to arouse the wish to please others, and even something of the *moral* impulse to be brave and conscientious.

Lastly, since every perfect action takes on something of the character of a habit, the educator should throughout this early branch of training aim at furthering the growth of habits. Hence he should insist on the continuity of performance, and other conditions, on which habit depends.

The careful graduation of work according to capability may be illustrated by the method of teaching deaf-mutes to speak by a process of imitation of seen movements. The teacher begins with such movements as extreme protrusions of the lips (as in uttering the *oo* sound), which are distinctly visible to the child when he himself performs them, and so easier of imitation. Only after a certain practice of the imitative capability in this simple form does he venture to go on to call forth the more delicate and hidden movements of the organs of articulation which cannot be guided by sight, and have to be taught by the aid of the sense of touch.

REFERENCES FOR READING.

A fuller account of the process and origin of voluntary movement may be obtained from the following: A. Bain, *The Emotions and the Will*, "The Will," chaps. i.-iii.; H. Höffding, *Outlines of Psychology*, vii., A; Sully, *The Human Mind*, vol. ii., chap. xvii.; and E. B. Titchener, *Outline of Psychology*, chap. x.

On the developments of voluntary movement in the first years the student may consult: B. Perez, *The First Three Years of Childhood*,

chaps. ii. and vii.; W. Preyer, *The Senses and the Will*, second part; and G. Compayré, *L'Evolution intellectuelle et morale de l'enfant*, chap. xii.

On the educational control of voluntary movement the following may be read: P. Radestock, *Habit in Education* (Isbister); G. Compayré, *Cours de Pédagogie*, leçon xi.; H. Marion, *Leçons de Psychologie*, leçon iii. and following: and E. Rayot, *Leçons de Psychologie*, leçon xvi. An article on "Manual Training" by Sir J. Crichton Browne, in the *National Review*, 1888, will also be found useful. The reader of German may compare, further, Th. Waitz, *Allgem. Pädagogik*, § 7; F. Dittes, *Grundriss*, §§ 13 and 14; also the article, "Gewöhnung," in Rein's *Encyclop. Handbuch der Pädagogik*.

CHAPTER XX.

DELIBERATE ACTION: MORAL CHARACTER.

In the preceding chapter we have traced the steps by which a child acquires the command of his organs of movement. It was there assumed that advance in voluntary movement during the first years of life took place under the stimulus of the bodily appetites, the desire for simple modes of sense-gratification, as well as the love of activity and the wish to display one's powers. We shall in the present chapter consider the higher developments of the volitional process in which new motive forces have their part, and in which action becomes more reflective, far-reaching in its aim, and what we call deliberate.

These higher developments of volition, which constitute *will* in the more restricted sense, are partly the outgrowth of that development of the intellectual and affective life which we have already traced out, partly the result of successive exercises of the volitional function itself. We will first examine the effects of the former.

(A) Effect on Volition of Development of Feeling and Desire. In the first place, then, it is clear that the expansion of the life of feeling, and especially the gradual evolution of the higher and more representative emotions, will serve to develop the conative processes. As a child acquires more and more of self-respect, of

the esteem of others' good opinion, of sympathy with others and so forth, new and higher desires will be added to the earlier ones, and will gain more and more strength.

(B) EFFECT OF DEVELOPMENT OF INTELLECTUAL POWER. We may now pass to the influence on the life of action of the processes of intellectual development, of the gradual formation of the ability to represent what is absent, to compare one thing with another, and to think.

To begin with, then, the progress of the intellectual life *by developing and strengthening the ideational or representative powers* will allow of a larger range of desire. The young child cannot aim at a remote gratification, say the pleasure of winning a prize six months hence. The representation of the remote end is not vivid and steady enough to direct action into effort for something so far off. This same "weakness in futurity" is seen in the savage whom some present enjoyment will make completely oblivious of a large future reward. A child only begins to work for distant results when he is able to keep an idea fixed in consciousness for some time.

Along with this effect of the growth of representation is *that of comparison and the co-ordination of parts into a whole.* In order to aim at a distant object a child must reflect on the connections of things, and see how present action may become a step in a process of gradual attainment. This implies a certain comparison and unification of experience-elements. Thus, in learning to carry out any prolonged active effort, *e.g.*, in building a castle with bricks or sand, a child has to think out the progressive action as a whole, and to set each successive step in its right place in the total *plan* of action.

This organisation and unification of action under the

guidance of rational reflection takes on a higher form when a series of actions of a like kind is integrated by thought into a *common type* or *general rule of action*, directed to one comprehensive and permanent end. This is illustrated when a child goes beyond single attempts to obtain his teacher's approving word and begins consciously to act under the direction of the general rule of trying to win and preserve his teacher's approval.[1]

This unification of action according to general rule for the attainment of a permanent end involves the co-ordination of a series of actions in an orderly progressive scheme. The abiding "interests" of life, such as bodily strength, knowledge, the good opinion of others, and so forth, are ends which only realise themselves progressively. Thus we develop bodily strength by proceeding according to a plan, carrying out certain exercises to-day, following these up by other and more advanced exercises to-morrow, and so forth.

The process of volitional unification is carried a stage further when thought or "practical reason" co-ordinates these several "interests" as parts of the total individual "good". This involves the exercise of the practical judgment, and an appreciation of the "objective value" of "good" or "end" (compare above, p. 494).

The final stage in this unification is reached when "my good" as a whole is co-ordinated with the end of morality or the common good. This grows out of the free acceptance of the moral law as inherently right and good (see above, p. 500).

[1] This seems to me to cover what Herbart rather oddly describes as the fusing of single will-pictures into a general will-concept, or will proper. See *Introduction to Herbart's Education* (Felkin), pp. 164, 165.

As the result of this influence of the growth of feeling and of thought upon conation, action takes on the appearance of a rational act, *i.e.*, one having its "reason" in a reflective purpose. This transition from the early type of impulsive to the later type of rational action brings in more of the element of calm deliberateness, more of the reflective consciousness of self as agent.

Of all this work of consolidating action and subjecting it to rational rule we see only the feeble beginnings during the years of childhood. Its fuller development belongs to a comparatively late period of youth when reason begins to attain to its proper strength and dominion. Nevertheless the first unsteady appearance of the rational element in children's actions is of deep interest.

(C) Effect of Volitional Exercise. While the development of feeling and thought thus serves to foster and develop the higher conative processes, something further is needed for their full realisation, *viz.*, exercises of the volitional function itself. As we saw in the case of movement, volitional growth takes place as the result of successive exercises gradually advancing in complexity.

This higher volitional progress implies *the effect of successive acts themselves in fixing a motive as a conative disposition.* It is not enough, for example, for a child to have a deep affection for his mother: this affection must acquire strength and fixity as an *active inclination.* Similarly the subordination of particular actions to a general rule of action only becomes perfect as the result of a series of acts. This fixing of lines of action through the firm establishment of motive-forces involves what

Herbart called the "memory of the will". It is, however, as we shall see presently, better described as an illustration of the great principle of Habit.

But this elevation of the later developed motives into a position of stability does not proceed in the smooth unopposed manner we have been supposing. It is through experiences of struggle that each of us rises to the calmer heights of rational conduct. We have now to examine this process of conflict so as to understand how a higher type of deliberate action arises out of it.

Conflict and Choice. The appearance of conflict on the volitional scene is a result of the expansion of the life of feeling and thought. A child becomes the subject of a larger number and variety of desires, and as he acquires the ability to take in remote as well as near objects of desire he will, it is evident, be acted upon in this or that situation by a larger number of impulses. Take the simple boyish problem of having a half-holiday to fill up. The boy with more interests outside his school life will in such a situation be the subject of a larger number of active impulses than the boy with fewer.

In certain favourable cases this emergence of a plurality of motive-forces may assume the form of a co-operation. In the case supposed a boy may want very much to look up some friend at a distance, and may also be desirous of having the bicycle ride which will take him to the spot. A strong disposition to activity, the love of doing things for the sake of doing them, often combines in this way in early life with the pursuit of ulterior ends.

In this imperfect world, however, it seems to be a

much commoner experience that the different motives which thus come into play together oppose one another, and so give rise to what we call *conflict of motives.* Such conflict may arise between motives of the same level in the scale of development, or those of different levels. An infant whose hands are already engaged holding a toy, and impelled to snatch at the new toy presented, say his father's beard, illustrates the first. The example of the boy who at the same time wants to play truant, and doesn't want to lose his marks, illustrates the second.

Such opposition delays or arrests action instead of expediting it, as the co-operation of motives does. Here we have a new manifestation of the phenomenon known as *the inhibition of movement.* In the case just instanced the thought of the loss of the marks inhibits or holds in the impulse to play the truant.

When rational motives first begin thus to interfere with the lower impulses, their restraining influence is small. A child, as already observed, is disposed to follow out any impulse which leads to immediate gratification. A small boy, when tempted to join other boys in some "lark" instead of going to school, will readily be carried away by the immediate prospect of exciting pleasure. Hence something more is necessary.

Here is the occasion for the development of a new and higher form of conation, *viz.*, what is called an "effort of will". Under a strong temptation we can only effectually resist the seductive influence by *resolving to pause and to think.* And every child has to learn how to do this before he acquires what we call a rational and firm will.

When once this initial step has been carried out, there

comes the process of reflective deliberation, of weighing and comparing what is gained and lost by the action. This involves the exercise of *the practical judgment*, that is to say, the calm estimation of *values*. In its highest form this exercise of judgment involves a reference to a large collective idea of "good".

In certain cases we find it hard to resolve the practical problem thus presented to us. We cannot *decide* as to the direction in which the best or the highest good lies. In such cases action is paralysed,—unless in the moral *impasse* impulse reasserts its primal violence and carries the day. Where, however, reason clearly discerns a preponderance of good, where there is a clear pronouncement, "my highest interest (or my duty) lies in this direction," the way is opened for action. We may be weak enough not to follow: *video meliora proboque, deteriora sequor*. But where we are courageous and adopt the decision of practical reason, identifying ourselves with it, we are said to carry out a *rational choice*. Such an act of reflective choice is the highest development of the volitional process. It is commonly regarded as the manifestation of our "free-will".

The ability thus to check impulse and carry out a process of calm deliberation and choice is the characteristic of a matured will. The acquisition of the ability is a slow process, which only begins in the first years of life, and which involves a good deal of self-discipline. Hence in this early period we find that the conflict is apt to resolve itself by the more violent impulse working itself out, or by a despairing abandonment of the problem of deciding.

What is needed for the attainment of the calmer and

more rational type of volition is, first of all, the disposition to arrest the forces of impulse, to pause before acting. Such a disposition is acquired slowly under the teachings of experience, *viz., the bad effects which often result from hasty action.* The minds of some children are specially retentive of such evil effects, and so acquire a certain cautiousness in action. In the second place, the child's practical intelligence needs to be exercised and strengthened so that he may gradually acquire readiness in comparing actions, and judging with respect to their wisdom and rightness. Lastly, the development of the higher feelings, all that we mean by moral culture, is needed in order that a child may come instantly to adopt the decision of practical reason, and choose the right and reasonable course of action.

RESOLUTION AND PERSEVERANCE. One further outcome of this higher volitional development is what is commonly known as "resolution" or determination in its higher degrees. This term implies the existence of a resolve to do something before the moment for carrying out the purpose arrives. The formation of a resolve involves reflection beforehand, and so a more distinct preparation for action. Thus a child that resolves to confess some fault to his mother has to look forward to a future set of circumstances, the next meeting with the mother, and to adopt beforehand a readiness to carry out the action. The *maintaining* of the attitude of resolution up to the right moment for action implies further a high degree of fixity and steadiness in the process of attention.

All the more difficult and prolonged processes of action involve something of this fixity of attitude. Before a

child can steadily pursue an end through a series of co-adjusted actions, *e.g.*, in learning his lesson, he must be able to maintain firmly in consciousness the idea of this end. This stability of the idea of end is seen in all *perseverance in action*.

While the power of deliberating and choosing gives to will its reasonableness, that of abiding by our decisions and persevering in our line of action gives to it its firmness or stability. Children are in general wanting in such firmness, just as they are wanting in stability and consistency of feeling and judgment.

It is important to distinguish the firmness of purpose and the stability of will here referred to from *obstinacy*. They appear to resemble one another inasmuch as each manifests itself in independent self-assertion, in resistance to the pressure of another will. Yet the resemblance is smaller than it looks. Without going so far as Herbart and saying that the obstinate self-will of a child is really absence of will, one may say that it differs from enlightened firmness in so far as it rests on no basis of rational conviction, and presupposes no process of reflective decision. Self-will is, however, often more than this, implying an intelligent self-consciousness and a legitimate claim to choose one's ends. And even foolish obstinacy in a child may rest on a firm persuasion of "I know best".[1]

SELF-CONTROL. The exercise of reflection and rational choice just described leads on to what is called Self-control. By this is meant the *development of rational motives as restraining and regulative principles*. A child reaches the stage of self-control or self-government

[1] Compare Mrs. Bryant, *Educational Ends*, p. 21.

when he can reflectively check and restrain the lower conative forces, or direct them to new and higher ends than they naturally follow.

Control is often spoken of as if it were merely inhibitory or restraining. No doubt this is the more striking aspect of it. When we talk of controlling passion we think first of mastering and subduing its force. But, strictly speaking, all control has a positive or directive, as well as a negative or repressive, aspect. Perfect control of the feelings means a rational direction of them towards worthy objects.

(*a*) CONTROL OF CONATIVE FORCES. The form of this control which first needs to be considered is directed to the due regulation of the several conative forces, and more particularly the lower and "natural" impulses. It shows a series of progressive stages corresponding to the stages in the evolution of rational conation already described. Thus a child learns first to control a strong impulse to snatch at a present pleasure by reference to some distant suffering; and later on to subject single desires to comprehensive and permanent aims or "interests".

Throughout this process there is at once inhibition and direction of the lower by the higher. The "natural impulses" are not crushed out of existence, they are transformed by rational reflection and so directed in the form of motives to what is recognised as having value.

(*b*) CONTROL OF THE FEELINGS. We may now pass to a second and no less important direction of the process of control, *viz.*, the controlling action of rational volition on the Feelings.

As we have seen, feeling in all its more intense forms

immediately gives rise to, and takes on its characteristic embodiment from, certain bodily changes, including movements of the "voluntary" muscles, such as those of the limbs and the vocal apparatus. Hence the control of feeling may begin by a control of the impulses to movement. For example, in checking the force of angry passion a child has first to learn to inhibit the bodily movements which give vent to it. Since, moreover, an emotional state and its bodily accompaniments are organically united and form parts of one total experience, it follows that this arrest of movement will tend to some extent to allay the force of the emotional excitement.

What may be the exact effect on the feeling itself of this restraint of muscular movement depends partly on the hold which the feeling has acquired on the mind, and partly on the temperament of the child. There are children who, even when outwardly calm, brood on their terrors, their injuries and so forth. Hence the need of the supplementary means of restraining feeling to be spoken of presently.

The due control of the feelings has a high moral significance. In what is called good-breeding there is involved a considerable amount of emotional self-restraint. The higher moral quality of considerateness implies a wider and more vigilant self-control, *viz.*, the repressing of every sign of feeling that would offend others. In another direction, the moral qualities, endurance and courage, include the ability to check the manifestations both of actual suffering and of the disturbing action of fear.

Lastly, it may be observed that here, as in the case of the lower conative forces, control is not merely repressive. A perfect regulation of the life of feeling by

volition includes the positive encouragement of good or worthy feeling. This applies, for example, to the keeping up of a cheerful, happy state of mind. As Dr. Johnson pithily remarked, " Vivacity is much an art, and depends greatly on habit ". It applies also to the deliberate cultivation of kind feeling, reverence and the like. Such a positive fostering of feeling may be furthered to some extent by adopting the characteristic bodily manifestation, though as we shall presently see it depends mainly on the maintenance of certain ideas.

The acquisition of the power of controlling feeling is a difficult and slow process. Children's emotional states are characterised by their great intensity, and their complete possession and mastery of the mind. Hence the effort to check the outgoings of passion is a severe one. It is to be remembered too that the motives which prompt to such efforts of self-control, *e.g.*, a regard for our own comfort, and the sense of what is seemly and right, are late in their development.

(*c*) CONTROL OF THE THOUGHTS. There remains one other region of our mental life, *viz.*, the intellectual processes. This too calls for the regulative action of the will. As was pointed out above, apart from volitional control a child's attention is drawn hither and thither according to the play of external excitants and the particular ideas which are called up by the forces of suggestion. The control of the intellectual processes means working against these chance influences with a view to concentrate attention on something which we specially wish to consider. This has been fully illustrated in dealing with the processes of sense-observation, recollection, imagination, and thought.

As we have seen, this control of the thoughts is at once inhibitory and augmentative. A child in concentrating his attention has at once to shut out irrelevant impressions and ideas, and to focus his mental energies on that which demands consideration.

At first such control is difficult and involves an effort of will. The motive to such volitional effort is *the desire to give greater precision and vividness to certain intellectual elements, and to realise in consciousness their full suggestiveness*. That is to say, the motive is the intellectual desire to advance knowledge. Hence it is only as this motive acquires strength and fixedness that volitional concentration becomes habitual.

Connections between Different Forms of Self-Control. It has already been implied that the three directions of control just dealt with are closely connected one with another. More particularly we may say that the control of the thoughts is involved in that of the feelings, and that the control both of the feelings and of the thoughts is involved in that of impulse and action. A word or two may suffice to make this clear.

(1) As we have seen above (p. 408), feeling is organically connected with presentation, and the more complex states of feeling depend upon some mode of intellectual activity, such as the perception of something alarming, or the idea of some injury to ourselves. Hence, to exercise control over the perceptions and ideas is clearly one mode of regulating the feelings. It was pointed out just now that we can only very imperfectly repress a state of emotional excitement by checking the accompanying movements. *The only thoroughly efficient way of reaching and mastering the force of feeling is by*

drawing off the thoughts from its exciting cause. Thus a child's feeling of disappointment is only fully brought under control when he is able voluntarily to turn his thoughts in some other direction.

In like manner, if we desire to bring on a certain state of feeling, the most efficient means at our disposal is the inducing and keeping before the mind of certain presentations or ideas. Thus we cultivate æsthetic admiration by deliberately seeking out aspects of nature and works of art which are fitted to excite it; we deliberately bring on a relenting and forgiving temper by dwelling on the ideas which are fitted to awaken kindly feeling.

(2) Again, since feeling and representative thought are both involved in volition, the perfect control of the domain of action includes the other forms of control. The impulse to act unkindly is only completely overcome when the feeling of anger out of which it springs is repressed, and the remembrance of the injury which excites the feeling banished from the mind. Hence the importance assigned by moralists to the control of the desires and thoughts "of the heart".

The same holds good with the positive side of this regulation. If I am disinclined to do something, I may overcome my indolence by dwelling on the idea of the action and calling up a representation of some resulting gratification.

The most important outcome of this slight examination of the processes of control is that *all control is ultimately control of the attention.* As we have seen, the volitional process is always at bottom a process of purposeful attention. It is by fixing attention on certain motor ideas that we bring about what is called voluntary movement. And it is by regulating the directions of our attention according to the special aims of the moment that we carry out those more complex processes

which we call control. Whether I am trying to control some movement, some feeling, or some intellectual process, I only effect a result by volitionally interfering with and altering the natural or spontaneous "movements of attention".

The exercise of these several forms of control, which is distinctive of the higher levels of human action, is acquired but slowly. Physiology helps to explain this fact in part by suggesting that the "Centres of Control" in the brain —which are presumably those of volitional attention— are the latest to be developed.

HABIT AND CONTROL. The higher volitional processes come under the same principle of habit which we have seen illustrated in the lower region of voluntary movement. A deliberate or fully considered act and an act of self-control only attain to a perfect form when they become fixed by the law of habit. That is to say, they tend to grow easy and "natural" with continuous repetition.

At first the child when "pulled up" by an apprehension of the evil consequences of a proposed action is apt to be overpowered by the contending impulses, and so incapable of a rational decision. But after he has once succeeded in making the required effort he will find the second attempt somewhat easier *because of the previous exertion*.[1] Every new exercise makes the pause, the consideration, the final calm decision a less arduous exertion. The whole process grows smoother, involving

[1] Herbart seems to question this. Basing the action of the education of the will on a "memory of the will," he supposes that children fail to follow up their effort because they lack this memory. But practice tells here not so much by way of a conscious memory as by setting up a psycho-*physical* disposition, a factor of which Herbart takes no account.

less and less of the friction of effort, till as a final result reflection and deliberate choice become easy and "natural," taking on something of the automatic character of a "habit". And this involves the setting up of a psycho-physical disposition.

MORAL HABITS. The same principle of habit has further and yet more striking results in *the fixing of the several forms of control.* The subordination of a lower impulse to a higher motive, which at the outset involves a painful effort of arrest and reflection, tends by repetition of the exertion to grow less and less difficult and irksome. Every time a child restrains his greed from a consideration of its evil effects on himself or others he helps to fix action in this particular line. That is to say, through repeated exertions *the higher moral force gains ground as a ruling disposition, and encounters less and less resistance.* The outcome of this process of growth is what Aristotle called a perfect virtuous habit, such as a fixed disposition to care for health or to speak the truth.

The conditions of the formation of habits already pointed out have to be satisfied here. The initial effort must be secured by a strength of motive sufficient to overcome the difficulty of the action and the disinclination to what is irksome. Not only so, there must be perseverance and an uninterrupted following up of the first success till the principle of habit clenches the process of moral acquisition.

CHARACTER. The term "character" (literally, "a distinctive mark") is often used loosely to denote distinctive individual peculiarities, whether showing themselves at the outset as strongly marked congenital tendencies, or

later as in part the result of experience and education. In a narrower and more accurate sense it is marked off from the group of congenital individual peculiarities (which is better named *idiosyncrasy*), and signifies *developed individuality*, that is, the group of natural tendencies so far as these have become selected, strengthened, and fixed by the action of circumstances, by education and by the individual's own efforts. Fixity or permanence of quality, as distinguished from changefulness and capriciousness, seems to be of the essence of "character".

While all mental peculiarities are elements of character, we see a tendency to give prominence in the concept "character" to what is peculiar and "characteristic" in modes of feeling and acting, and in modes of thinking only so far as they affect action. We thus see that the word has a special reference to the volitional processes. An odd character is one who acts from odd motives, has odd habits, follows out in action odd fancies. In this narrower and more precise sense "character" means fixed volitional dispositions (together with fixed emotive and intellectual tendencies corresponding to these), which are the result of development and education (including self-education).

While the word "character" has at its root a reference to individual differences, it has come to connote certain typical *resemblances* among individual characters. We may mark off this use of the word by the more precise expression *type of character*. Thus we speak of a good, of a gentle character, and so forth.

The tendencies here briefly indicated are clearly seen in the current ethical and educational use of the word. What is meant by a good or a moral character is an

acquired and fixed condition of the *will*, and of the feelings and thoughts so far as this is involved in the first. It is thus, as Aristotle long since pointed out, the product of the individual's own exertions. And it is common or typical since it indicates a group of qualities which we expect all normal and properly educated individuals to manifest.

This moral or virtuous type of character has for its mental constituents the several forms of self-control carried to the point of perfect habits. Thus a perfect moral character includes the fixed dispositions involved in a wise pursuit of individual good, or "prudence," such as industry, orderliness, "temperance"; further, the habitual control of the feelings, or moderation of feeling, and that firm control of the thoughts which is at the basis of reasonableness. It includes further a fixing of the special dispositions answering to the several virtues, and implied in a perfect fulfilment of human duty, such as courage, veracity, justice and beneficence. It is the work of Ethical Science to construct methodically the ideal moral character.

It is commonly said that moral character is a bundle of habits or fixed dispositions answering to the several parts of virtue. This is an important definition, so far as it brings out the essential ingredient of character, fixity of volitional disposition in right directions. At the same time it must not be thought that a perfect character shows itself in a habitual and half-mechanical pursuance of a number of detached ends or forms of good. Self-control is essentially control of attention, and so includes conscious reflection and the disposition to reflect. A perfect character is one which is reflectively intelligent in

the sense that it strives to co-ordinate each of its aims under a general conception of good which it makes supreme, and is ready, where new circumstances arise and the line of right action is not at once apparent, to pause and reflect. As Mrs. Bryant says: "Virtue can never become a sum of habits, and for this plain reason: there is not a single good habit except the habit of being good (*i.e.*, of a good will) that may not conflict with real duty at some point or other".[1]

It follows from this fact of the supremacy in a good character of moral reflection over the particular virtuous habits that *character is never rigidly fixed*. Habit, when carried to an extreme, involves, as we saw above, the arrest of the developmental process in a certain direction. Now a virtuous character aims at an ideal of a worthy personality which is never fully realised. Nay, more, it is continually modifying its ideal as the result of new moral experiences, new assimilations of the results of others' experiences and thought, and new individual reflection. As George Eliot and others have taught us, duty, as expounded in the school, is a mere rough *scheme* which each of us has to fill out for himself in the pauses of the struggle of life. It is our own experiences, observations of life, and thought which instruct us as to the particular lines of activity in which we may best give effect to the commands of justice, veracity and benevolence, and as to the relative values of this and that constituent of good conduct; and this process of ethical self-education, this work of giving a definite form and a rich yet ordered variety of content to the conception of the virtuous life, may go on as long as we continue to live consciously and fully.

EARLY MANIFESTATIONS OF THE HIGHER VOLITION. Although the more complex processes of volitional development traced out in this chapter belong to the later period of youth and manhood, we may detect the crude beginnings of them in the first years. Even a young child will spontaneously show a tendency to pause and

[1] See her work, *Educational Ends*, p. 21.

reflect before he acts. Similarly, he will spontaneously (*i.e.*, without any immediate command or suggestion from another) make an effort to control his feeling of misery. With respect to moral action, we must do him the justice to recognise that impulses *in the direction of right conduct* appear from an early date, such as those of kindness, helpfulness and so forth (compare above, pp. 458, 464).[1]

Yet, even when allowing for the great differences among children, we must say that in general these manifestations of the higher will are feeble and sporadic only. We do not look in young children for steady, fixed purpose, for the essential constituents of moral character. Their impulses are capricious and unsteady: a good one being readily displaced by one that we regard as bad. So far from being morally an organised unity or personality, the child seems rather to be a bundle of impulses and tendencies, a number of alternating, and but half-formed selves.

EDUCATION OF WILL AND CHARACTER.

The acquisition by the individual of the higher volitional processes and of moral character is greatly furthered by the action of others. In truth, the action of the social environment on the growing mind of the child is still more manifest in the case of moral than of intellectual development. The very idea of a morally good will implies the discipline supplied by a community which has a system of morality.

This moral action of the community on the individual works at first through the medium of those who exercise

[1] These spontaneous tendencies towards good conduct are illustrated in my *Studies of Childhood*, chaps. vii. and viii.

authority during the early years. As we saw in tracing the growth of the moral sentiment, the influence of authority and of moral discipline is a necessary condition in the formation of that sense of duty, the supremacy of which marks the highest stage of self-control.

The training of the child's will to fixed and worthy lines of action proceeds partly by way of the early government of the home and the school, and the system of rules which this implies. We have now to examine the mode of action of this government on the development of the child's will and character.

THE ENDS OF EARLY GOVERNMENT. By government is meant the exercise of control over the actions of others by a superior, that is to say, one invested with authority and able to promulgate and enforce commands. The government of the young is differentiated from that of adults—as illustrated in civil and military government—by its special aims and by the special conditions under which it is carried on.

It is commonly allowed that children require to be placed under some amount of governmental control. It belongs to the condition of childhood, with its want of knowledge and ability to act for itself, that the experience and character of the adult should decide to some extent the *lines* of its action, and should impose these decisions by way of positive command and prohibition. Here, it is evident, the end of government is in part to protect the child against the evil physical effects of his own action. To leave a "wee mite" of four or six altogether to the "discipline of consequences," in the shape of nature's penalties for violating her laws, would

be too dangerous an experiment for any one who really cares for children. A child's actions have further to be restrained because they are likely to annoy or injure others. No parent can allow a child to strike another child as he might often like to do, or even to take playful liberties with a visitor's pockets.

But the institution of early government has other ends and uses. It is fitted, where properly organised and judiciously carried out, to supply a certain *moral training*. It aims from the first at directing young impulse into right channels, and at developing habits of good conduct. In other words, it has a valuable *disciplinary* function.

That some control of the child's actions by his elders is necessary for moral purposes will probably be conceded. The most optimistic view of childish nature must recognise the existence of natural impulses, *e.g.*, greediness and covetousness, which require firm restraining. Nor can it be safely contended that the natural consequences of wrong actions in the loss of the parent's society and confidence can always be counted on in the first years of life to deter from such actions. Even were such natural penalties sufficient to deter the child, it is very doubtful whether they would ever bring him to a consciousness of the binding nature of duty.

Our concern here is merely with the moral function of early government. We shall seek to determine the main conditions which make the government of the parent and the teacher an instrument of moral discipline, or, as we may call it, a good or disciplinary government.

CONDITIONS OF A GOOD GOVERNMENT. In order that the governmental control of children's action may be

morally educative it must exhibit certain features. The more conspicuous and dominant these features are made, the higher will be the moral value of the government.

To begin with, then, a good mode of government must proceed *by appealing to the child's will.* Mere physical compulsion, as when a nurse supposes she is getting a child to walk by dragging it, is not government in the sense here meant. Nor are those modes of exercising the "superior will" which resemble physical compulsion, *viz.*, coercion by threat of immediate suffering, as seen in the brutal government of the slave-driver and the coarser forms of military government, to be considered here. Further, the restraining of the actions in the first year by *singular* commands and prohibitions, as, "Do this at once!" "Stop that!" may be left out of consideration as not belonging to the mode of government proper to an intelligent subject.

Early government becomes disciplinary and acts developmentally on the young will as soon as it begins to promulgate *general commands.* The difference between proceeding by saying, "Do this!" "Don't do that!" and by saying, "Be a good boy!" "Don't be a naughty boy!" consists in this, that in the latter case the governor introduces a *general principle* or *rule* of action, and so acts upon the primal chaos of capricious and isolated impulses by developing orderliness of action and stability of purpose.

Again, the educational value of any system of governmental rules will depend to some extent on a judicious admixture of positive commands and prohibitions. In one sense prohibition is the most fundamental need of early government: an inexperienced child must be re-

strained from dangerous and mischievous actions. It has been suggested, too, *e.g.*, by Miss Edgeworth, that prohibitions are often more easily enforced than positive commands; but this seems to apply to that earlier form of control which, not being able to work by way of a child's intelligence, is nearer to physical compulsion.[1] It is an undoubted fact that as soon as a child develops intelligence a prohibition acts irritatingly by opposing itself directly to his love of activity and liberty, whereas a positive command may recommend itself by suggesting an agreeable line of activity, and in any case does not oppose itself so sharply and irritatingly to the love of liberty (save indirectly in so far as it requires the child *not* to do something else).

Another point closely connected with this is that both command and prohibition act upon the child's mind by way of *suggestion*, that is to say, the setting up of a fixed idea which tends, quite apart from volition, to work itself out into action. This force of suggestion is seen in its more impressive forms in the case of the hypnotised subject who is made to do something, *e.g.*, drink some unpleasant liquid by being told that it is wine. Yet the same principle is at work in the case of children. Now, a command clearly *suggests* the particular action which is desired, whereas a prohibition suggests quite as certainly *the forbidden action.* This is illustrated in an ingenious mode of advertisement I once saw used in a London street. A "sandwich man" was carrying two boards, on the front one of which were printed the words, "Don't look at my back!" where of course the advertisement to be looked at was to be found. This tendency is an

[1] See Miss Edgeworth's *Practical Education*, chap. ix.

example of what Professor Mark Baldwin calls "contrary suggestion".[1]

The great reason, however, for making the positive element more prominent than the negative and inhibitory is that *while the latter tends merely to check action the former works developmentally and constructively by calling out lines of worthy action.* The highest moral use of this early form of government is seen in bringing a child to follow out habitually those directions of action which constitute good conduct, such as personal cleanliness, orderliness of behaviour, and industry.

The educative value of rules depends further on the way in which they are selected and enforced. It is only too easy, as Locke and others remind us, to multiply rules to an injurious excess. After all, government is restraint, and a child with his intense love of activity and his strong preference for initiating his activities for himself, may be led by the oppressive character of the rules enforced to oppose himself to them, and so to make them morally injurious rather than beneficial. A like effect follows when a rule looks needless and capricious, or when it is unintelligently expressed so that its meaning is dark. Much the same kind of remark applies to the mode of enforcement. Where the parent or teacher appears not to respect the rule as of universal obligation but to be partial and capricious in enforcing it, or, on the other hand, to be stupidly wanting in discriminating

[1] See his *Mental Development*, p. 145 f. ; *cf.* my *Studies of Childhood*, p. 294, also Perez, *First Three Years of Childhood*, p. 108. The importance of suggestion as an educational principle has been recognised by a number of recent writers. See especially, J. M. Guyau, *Education and Heredity*, chap. i.

cases which properly fall under it from those which do not, the good effect is lost, and the mode of government becomes immoral rather than moral.

INSTRUMENTS OF EARLY GOVERNMENT: PUNISHMENT AND REWARD. We may now examine the effect of the agencies by which the government of children is commonly enforced. Here the imposition of punishment, which seems to be most closely connected with the existence of an authority which issues commands, comes in for our first consideration.

Punishment may be briefly defined as the intentional infliction of pain of some kind as the consequence of an act of disobedience. The pain may be physical, as that of corporal punishment, and, in a measure, that of confinement, or it may involve a higher sensibility, such as loss of a good position and disgrace.

This definition is meant to exclude what are sometimes spoken of rather figuratively as "natural penalties," such as the physical evils consequent on intemperance. It excludes, too, the pains inflicted by nurses and parents by way of slaps on single actions of the child not antecedently forbidden.

Punishment has a twofold outlook, *viz.*, on the maintenance of an orderly community and on the improvement of the individual child. The first or *deterrent function* is more prominent in the punishments inflicted on adults, for example, by magistrates and military authorities. It enters into the government of children in so far as these compose a closely organised band, having its definite work, and needing stringent uniformity of behaviour. Thus in a school the exigencies of maintaining order and carrying on the work of the class compel the authority

to use punishment as a general deterrent. For the rest the punishments used by parent and teacher alike have, or should have, as their chief use the second and *corrective function.*[1]

In order that punishment may be made an instrument of moral education, certain conditions must be satisfied.

To begin with, all punishment looked at from one point of view is an evil. It is an infliction of pain, and pain, as such, and without reference to its results, is an evil. Moreover it tends, primarily, to produce certain evil results. Thus it is apt, at first at least, to divide the parent or teacher and the child, and so to interfere with that sympathetic *rapport* which is at the basis of Education. It is, further, in many of its forms at any rate, humiliating by reason of its degrading aspect, bringing home to the child the superior power of the adult " giant " in a way that excites hatred and the spirit of revolt.

It may be added that punishment at its best has only a limited range of action. In itself as a form of pain it is inhibitory rather than stimulative and educative; and even when it is intended to be stimulative, as in punishing for not doing an allotted task, the fear of it will never rouse a child's exertion beyond the point exacted.

The justification of punishment as a disciplinary or educative measure, in spite of these drawbacks, rests

[1] These words "deterrent" and "corrective" do not exactly represent the difference implied, since a corrective punishment acts deterringly on the individual, and on the other hand a punishment may be inflicted for the maintenance of order which is corrective of a general or widespread tendency to disobedience.

on the conviction that it may be made to bring home to a little culprit in a peculiarly vivid manner the seriousness and heinousness of his wrongdoing, and so act correctively on his faulty disposition. According to this proper view, punishment is not merely the introduction into the sphere of the child's action of the deterrent function of pain (which natural consequences might also introduce) but the strong expression on the part of the enlightened will of a determination to respect the moral law and to resist and put down disrespect of it and disobedience to its commands. As we know, when viewed in this light by the young offender, and accepted as just, so far from being resented and breeding animosity, it may deepen his respect for the person placed in authority over him.

This view of punishment at once suggests that it must be administered with great care and discrimination. To begin with, it ought not to be made use of save where the action clearly indicates more than ordinary thoughtlessness, *viz.*, a disposition to disobey rule. Even here it should be looked on, as war is said to be looked upon by kings, as an *ultima ratio*, and only resorted to when other means—such as talking to a child and pointing out his fault, getting at the source of it and acting amelioratively on the child's external circumstances—have been exhausted. Hence punishment should not in general be inflicted for single acts of wrongdoing, but only for such repeated acts as indicate a fixed determination to disobey. Even then we are not justified in punishing unless we have a reasonable prospect of acting effectively and beneficially on the young will. And here we need a wide experience of child-nature in

general as well as intimate knowledge of the individual child we are dealing with.

When we have satisfied ourselves that it is a proper case for punishment, something remains to be done in selecting the right amount and the suitable form of penalty. What is meant by a "sense of justice" in the educator shows itself in a peculiarly impressive manner in what has been called "proportioning punishment to offence". Here a fine sense of ethical values is needed, so that the seriousness of the offence may be adequately represented by the punishment. But this is not all. We cannot in dealing with children as with adults attach beforehand definite penalties to certain offences in all cases. Punishment as inflicted on the young is eminently a matter of adjustment to individual cases, to differences of character and sensibility, as well as of circumstances.

As to the form of punishment to be selected, Bentham and others have pointed out that it is well to select those modes which lend themselves to quantitative gradation, and are little affected by differences of individual sensibility. Judged in this way, confinement and hard work are better than corporal punishment. Where a mode of punishment may be seen by the child to have a natural connection with the act of disobedience, or, as Bentham has it, where the punishment is "characteristical"—as where idleness and neglect of school-work are punished by confinement during play-hours—it may be well to adopt it by preference if only to show the child as early as possible that punishment is not an arbitrary institution.[1] But these general considerations carry us but a little way. Only a careful study of the individual child can tell us what is the best form, that is, the form most likely to prove reformatory in any given case.

With punishments in early government rewards are commonly supposed to be correlated. As Locke has

[1] For an account of Bentham's principles, see Professor Bain, *Education as a Science*, p. 106, note.

it: "Remove Hope and Fear, and there is an End of all Discipline".[1] As punishment acts deterrently on a child's dislike of pain, a reward acts stimulatively on his love of pleasure.

A reward may be defined as the giving of some pleasure to a child—whether by way of a "present" or "gift," of a position of honour, or what not—as a consequence of some special exhibition of good conduct and of what is called merit. It is thus essential to a reward that it be given and taken as an emphatic expression of commendation.

Here, again, it is important to distinguish the disciplinary or educative from the merely governmental or order-serving function. When, for example, a mother promises her rather obstreperous children a special treat if they will only keep "good" through the ordeal of a stranger's visit to her, she may be helping to avoid disorderliness, but she is not making use of reward in its higher sense. As Locke says: "Rewards should be never offer'd or bestow'd on them (children) as the Reward of this or that particular Performance".[2] The educative value of a reward depends on its being given for a prolonged and habitual exertion of will in some good direction, *e.g.*, industry in school-work. It depends also on its being given as a recognition of a special or exceptional effort of will or "virtue," as distinct from a bare compliance with the obvious demands of duty. Its good effect presupposes further its not having previously been counted on and definitely aimed at. The more spontaneous the reward the more emphatically expressive will it be of the parent's or teacher's approval and com-

[1] *Thoughts on Education*, § 54. [2] *Op. cit.*, § 53.

mendation, and the greater, consequently, its moral effect.

It is just as easy to over-reward children as to over-punish them, and in some respects the effects of the former are worse than those of the latter. It fosters the idea that a reward is a thing to which the child has a right, as also the habit of aiming at it. The keen desire for pleasure in the child tends, as Waitz and others have shown, to make a too free and injudicious use of rewards specially injurious.

School-prizes, to which the English school-system still appears to be obstinately attached, are to be carefully distinguished from rewards proper. As the result of competition they are not given necessarily for exertion of will at all, but, as boys and girls are quick enough to see, often for natural cleverness and early advantages. They act by way of the dangerous though still much-praised motive of rivalry. As such, however—and this may turn out to be one of their redeeming features from an ethical point of view—they act only on the two or three boys of the form who have a good chance of winning the coveted possession.

Expression of Approval and Disapproval: Praise and Blame. Punishments and Rewards are after all morally useful only as an outward and emphatic expression of the governor's disapprobation and approbation. As soon as a child begins to acquire good habits under a careful governmental system, and comes under the compelling force of the love of approbation, adventitious aids ought to become unnecessary. The word and look of rebuke, with some permanent loss of good opinion, the word and look of complete satisfaction and approval,

with some permanent increase of favour, these have a far higher educative function than the use of what are commonly called punishments and rewards.

Such manifestation of approval and disapproval, again, may, if injudiciously resorted to, be mis-educative rather than educative. To know when to blame, when to accept compliance with rule without sign of favour or disfavour as a matter of course, and when to give commendation, implies much knowledge of child-nature, both general and individual. We may readily depress young effort and produce deadness of sensibility by much blaming, and on the other hand develop an excessive love of the sweets of praise by frequent commendation.

Praise and blame, like reward and punishment, to which they are so closely allied, act educatively on the young will by supplying temporary aids to the development of a love of duty and a habitual pursuit of it for its own sake. They are both institutions which, like the visits of the good doctor, aim at rendering themselves unnecessary. The employment of them should be made to further the development of the child's feeling of what is right, so that he will more and more suffer under disapproval, because he feels it to be just, and on the other hand will on receiving commendation experience more and more of what Herbart calls the "joy of *deserved approbation*".

EDUCATIONAL DEVELOPMENT OF A SELF-RELIANT AND GOOD WILL. If, as is commonly allowed, the aim of moral discipline and of moral education as a whole is to help to develop a will which aims of itself, and apart from external pressures and attractions, at what is good, it follows that the system of child-government must little

by little relax its hold. In proportion as the young subject grows in intelligence, he should be led to discern *the intrinsic reasonableness of the rules of conduct* laid down, and to choose them as his own principles of action. Only in this way can the educator help to develop those capabilities of moral reflection and wise choice on which self-government and a strong self-supporting character are based.

The action of education, as ordinarily understood, on this development of "moral freedom," is real and important, though it is not easy to define its exact range. Certain writers appear to have overestimated its influence, partly, as in the case of Locke, by not fully recognising how much these higher moral attainments are the result of the individual's own exertions, and partly, as in the case of Herbart, by exaggerating the effect of intellectual instruction and the connected culture of the feelings in exciting and directing the many and various lines of exertion implied. One thing is clear, that since the "reactions" to be called forth here are free, self-determining actions, *the influence of education must here in a peculiar manner work indirectly rather than directly*.

To begin with, then, *a valuable preparation for the age of freedom may be contributed by the early system of government itself* when this is wise and good, and pervaded by the spirit of a worthy personality. This applies alike to the government of the home and of the school. A school must, in the very process of carrying out its work in an orderly way, lead the child in the direction of a wise after-choice. The habits of obedience formed in a good home or a good school are valuable

not only as furnishing an element of stability of will and subjection to general rule, but as indicating beforehand the directions which the freed and self-reliant will is to follow. This applies not only to such small matters as those of good decorum, manners and an orderly way of treating one's own person and one's belongings, but to the graver matters of mastering passion, of curbing impulse, and of practising the virtues of industry, truthfulness and so forth.

Nevertheless, this indirect action of early government is limited in its scope. The lines of action which we consider it necessary that a child should carry out in the home or the school do not by a long way coincide with the wide and varied field of human duty. And, as we have seen, habits of obedience, however necessary at a certain stage of human development, do not of themselves constitute virtuous dispositions: in order that they may grow into these, *exercises in reflection and choice must be added.*

In seeking to develop this moral "self-activity," education has carefully, like the best art, to conceal itself. It may act beneficially in many ways, but *its action when most successful is most disguised and subtle.* This applies to *the whole work of intellectual training* so far as this tends to develop the ideas which belong to an enlightened will as well as the feelings which underlie all the worthier desires. It applies, too, *to that part of instruction which has a distinct and easily recognisable moral aim.* Direct and formal moral teaching is apt to exercise but a feeble influence on a boy's conduct: but a wisely selected and skilfully presented example of virtue or its opposite from the page of history or fiction

may strike home, and start a long process of self-education.

The beneficial effect of such instruction on the growing will depends largely on *the subtle influence of personality.* The same presentation of a virtuous act drawn from history or imaginative literature will have very unequal effects according as it is or is not felt to be vitalised and warmed by the instructor's own appreciative admiration. It is, however, in the more direct forms of moral instruction, in which particular lines of virtuous conduct are inculcated, that this influence of personality is seen most clearly. Here is the opportunity for the educator to conceal his art and to rely on the secret but powerful influences of personality. The force at work is that spoken of above as "*suggestion*". Educational suggestion resembles that of hypnotism in implying a certain *rapport* between operator and subject, and, further, in the fact that the subject is not fully aware of the operator's intention. A parent or master who skilfully uses some occasion of exposed defect or fault to set up in a boy's mind a fruit-bearing moral idea illustrates this suggestive force of personality.

The fostering influence of education becomes still more indirect *when the child is definitely left to exercise his own judgment, to act for himself,* without command or suasion, or even bare suggestion, and with nothing to guide him but the known character and preferences of the educator. Such exercises in free choice are absolutely essential to the growth of a stable freedom, and it is a part of the educator's work to supply them. The home, with its larger and freer range of activity, must of course offer a wider field than the school here.

Scope of Moral Influence in the Home and the School. As implied in what has been said above, the home and the school have each its characteristic function in the development of the child's will and the formation of his moral character. The home has special opportunities here. For one thing it acts much earlier than the school, at the time when "first impressions" are acquired. It is a commonplace that the best men who have taken the world into their confidence have expressed their indebtedness to the early fostering influence of the mother. Again, in the home in the first years the whole of a child's life and activity is controlled by the educator. He is watched, controlled and guided through the whole round of his daily activity, even his play being supervised and directly or indirectly determined by others. And this wide, all-comprehensive action of the home continues, or may continue, long after the child goes to school, and begins to form outside attachments.

With this fact must be taken another, that the family relations, involving warmer affections and more habitual and intimate intercourse, give a peculiar intensity and depth to the moral influence of personality in the home. This applies in a special manner to the controlling and guiding influence of the mother during the first years. In her directive action on the young will we see at their best obedience to authority, and the persuasive influence of example and of personal suggestion. And this authoritative personal influence of the mother is supported more and more and supplemented by that of the father, who when the relations are favourable has unique opportunities of strengthening the young will by supplying correction which is effective because it emanates from a respected and beloved person, and of proffering the counsel which is the fruit of experience.

It seems to follow from all this that the home is fitted to act educatively on all the main directions of the moral life. Assuming that the family life supplies a child with companions sufficiently near himself in age, a happy and wisely supervised home should be made to cultivate the germs of orderliness, industry, veracity, a sense of justice, together with the gentler and finer qualities of individual sympathy, considerateness for others, and active kindness.

Contrasted with this the moral education supplied by the school looks at first thin and unsubstantial enough. The schoolmaster (in the day-school at least) has a definite work to carry out, *viz.*, teaching, and naturally enough his system of government is worked mainly with a view to this necessary result. Again, he stands in too remote and artificial a relation to his pupils, and has too little to do with that part

of their activity which is of greatest interest to them, to allow of the intimate personal sympathy and the penetrating moral influence which are possible in the home. It may be added that the schoolmaster has not the parent's means of knowing the innermost feelings and dispositions of his children, of wisely exercising the young will in various directions of moral effort, and of supplying the chastening influence of correction and counsel. Whether the boarding-school can provide in its extended discipline a substitute for the moral influence of the home, is, to say the least, a very disputable proposition.

At the same time school life, including that freer part of it which is passed outside the schoolroom, introduces new and important moral influences of its own. Thus the requirement that grows immediately out of the institution and government of the school, that each child should behave in a definitely prescribed way, remaining quiet, orderly and so forth, is a valuable element of moral discipline. It is in the school with its larger numbers, in which each finds himself subjected to precisely the same rules, that the universality of law is first clearly learned. Still more important is the disciplinary action of the schoolmaster in insisting on honest and methodical work, and thus developing the qualities of industry, self-reliance and conscientiousness. To this it may be added that the *régime* of the school, just because of its cold impartiality, helps to develop self-reliance, and in close connection with this a consciousness of one's rights, and a keen sense of justice—more particularly on the side of equality—in a way in which the government of the home, at least in the early years, can hardly do.

In the freer intercourse with school companions outside the classroom a child finds, as we saw above, in a larger community of relatively equal wills, just those conditions which help to show the natural foundations of morality (see above, p. 504). It is here, when isolated from his home and family, a unit in a community, bound together not by kinship and a common life, but at most by a circumscribed group of interests, when thrown on his own resources, and when having to find a *modus vivendi* with other equally unprotected units, that he first comes to a real exercise of his own will. It is here, too, that he first makes acquaintance with a corporate feeling and with public opinion on a small scale, and so comes under the influence of *law detached from a personality*; and though, as we know, this influence may be excessive, acting oppressively on individual liberties, and exerting its pressure in unworthy directions, it may also when wisely directed become the best preparation for a resolute taking up of one's station and one's duty in that larger community of strangers which we call the world.

SUPPLEMENT TO CHAPTER XX.

(A) DISTINCTNESS AND UNITY OF EDUCATIONAL PROCESSES.

The line of exposition followed in this work is based on the idea that the three aspects of our mental life are in a manner independent, that each of them may develop its special tendencies *without a corresponding measure of development of the other aspects.* It is this idea which scientifically justifies our speaking of distinct processes of education corresponding to the ends of an enlightened intelligence, a refined feeling for what has real worth, and a firm character (compare above, chap. iv.). There is a sense in which the result aimed at in education can never be reduced to a unity.[1] It will not do to think that by training a boy's intelligence we necessarily develop his moral good will or even cultivate his taste. The educator who desires to do his work completely must ever keep his eye on each of the three great constituents of human worth.

While it is important for the educator thus to keep in view the different constituents of a fully developed man, and to some extent to make the realisation of each a special aim, our study of the processes of mental development has made it clear that these different directions of educative activity are closely interconnected. Thus we have seen that the connections between the intellectual processes and certain groups of feelings are vital, and are implied in speaking about interests.

[1] The tendency to over-unify the educational processes is seen, I think, in Herbart's treatment of the education of the intellect and feelings as subordinate to that of will and character; and again, in his tendency to identify the perception of moral relations with æsthetic perception (see especially his work, *The Science of Education*, Felkin's translation, pp. 78 ff., and 106 ff. ; also p. 66 f.). Mrs. Bryant shows a similar tendency to identify logical and moral education (*Educational Ends*, "Conclusion"). It is instructive to note that she makes no reference to æsthetic culture.

These interests involve a reciprocal action of the closest possible kind between intellectual and affective elements.

The same close connection, and the same reciprocal action, show themselves when we consider intellection and feeling in their relation to conation. That thought and feeling contribute each its vital element to the developed processes of volition has been insisted upon in this work. While we remember—as against Herbart's attempt to view volition as a mere product of presentations and the feelings which grow out of their interaction—that it has its independent origin in certain congenital impulses, we may cordially accept from him much that he says about the need of forming the "good will" through processes of intellectual instruction and the culture of the feelings.

Even here, however, we must remember, as against the one-sidedness of the Herbartian, that the relation is one of *reciprocal* aid and furtherance. Not only does the intelligent and efficient educator act indirectly upon the will and character by presenting new intellectual material for assimilation, and, as a result of this, introducing new movement into the life of feeling, *he aims at realising the highest development of thought and feeling alike by training and forming the will.* As we have seen, all the finest products of intellect and feeling come to us by way not of direct instruction, but *of our own individual efforts.* There is no thinking, in the full sense of this word, which is not the outcome of a volitional process. Probably the greatest service which the school renders to the young will is that it exercises it constantly and methodically in the vigorous and steady industries of thought. The same remark applies to the finer developments of the emotional life. The discerning love of virtue, as we see it in the best of men, the pure devotion to truth, as we see it in the scholar and man of science, and the refined enthusiasm for the beauty of things, as we see it in the artist, never came to their possessor by nature, or, indeed, by gift of the schoolmaster. They have been sought for and diligently cultivated by the active volitional processes of self-education, and we most effectually further the growth of these higher feelings by stimulating the young will to set out on this path of self-education.

(B) TYPICAL DEVELOPMENT AND ITS VARIETIES: INDIVIDUALITY.

In tracing out the typical form of the mental life we have indicated here and there how it gets differentiated into this and that variety. These variations of mind and character are, it must be evident, of the greatest consequence to the educator.

A proper understanding of the differences of mental characteristics observable among individuals would have to set out with a consideration of certain broad diversities, *viz.*, those of race, and that of the sexes. Although a beginning has been made in elucidating the distinguishing characters of boys and of girls, and of children of different races, our knowledge of both is still very imperfect. One of the most definite results yet reached here is the difference in general between the course of intellectual development of a boy and a girl. A comparative study of the feelings and interests of the sexes—so far as these can be said to develop spontaneously—would be deeply interesting and of the highest importance.

Leaving the deep-reaching organic causes of differences, we have the varieties of mind and character as they appear among individuals of the same sex and race. These differences have been studied in ancient and in modern times. Earlier speculation tried to classify them, referring them to a physiological base, under the celebrated doctrine of "temperaments". That organic differences underlie and determine such typical differences is certain; yet the old attempts of the doctrine of temperaments and of the later doctrine of phrenology are now discarded by science; and she seems still chary of offering us a new and better theory.

From a psychological point of view we may to some extent classify minds according to the relative preponderance of intellect, of feeling, or of will; and, again, according to the special modifications of each, such as the excitable and calm types of emotional character, the quick and intuitive, and slow and discursive types of intelligence. Further, we can already begin to descry certain connections or "correlations" between these differences. Thus there is little doubt that a certain kind of emotional vivacity helps to determine the characteristic play of imagination and of intellection generally. It must be confessed, however, that in spite of a good deal of recent and valuable work in this field science has not yet supplied us with a satisfactory classification of types of character.

We may now pass to more complex and concrete differences among minds, *viz.*, to those which underlie what we call Individuality.

Nature of Individuality. By individuality is meant the particular aggregate of mental characteristics which gives to a person his distinctive stamp, and makes him a *different* being from others, and not merely *another being*. Any feature, intellectual or other, which helps to render the individual thus distinct may be called *individualising*.

Individuality may be regarded as divergence from a common or

"average" type of mind. Such divergence may arise in one of two ways: (1) A child or an adult may be considerably above the common level of his age, and known as gifted; or, on the other hand, may fall considerably below this level, and be backward and dull.

(2) Individuality, as commonly understood, implies a reference to *the mode of arrangement* of the several constituents of a human mind. A child has individuality when certain characters or groups of characters show themselves in more than ordinary intensity, so as to give a dominant colour to the mind, and when these dominant characters take on peculiar modifications and modes of expression. Thus a child's mind becomes individualised by the appearance of an exceptionally strong bent to inquiry about things, and to certain directions of inquiry, and also to a peculiar manner of inquiring.

It follows from this definition that individuality is *a thing of degrees*. Some children have much more individuality than others, as seen in their modes of observing, thinking, giving practical effect to their feelings, etc. The degree of individuality in any case is determined by the *amount of divergence* of the characters from the common standard, and by *the number of such divergences*.[1]

Individuality as a quality of normal persons must be carefully distinguished from *eccentricity*, that is, any deviation from the normal type which approaches to *mental aberration*. What may be the exact limits of a perfectly sane variation of mental characteristics we need not here seek to determine. Suffice it to say that all healthy individuality is *variation confined within the limits of normal development*.

As we have seen, a certain amount of individuality discloses itself in the early years of life (compare above, p. 86 ff.). Two infants will look at you, will use their hands, will cry and so forth, in slightly different ways, and these divergences become much more plainly marked in the second and third years. Yet although a child has the natural basis and the germ of individuality, he does not exhibit it in its higher human degrees. It seems to be a biological principle that the higher an organism in the scale of life, the wider the range of individual differentiation; and the same law holds of the successive stages of development of the individual. Just as human faces get more and more unlike with the progress of the years, so do their minds. Hence *individuality in its fullest sense is a product of development*. It may be added that it is only this matured indi-

[1] Provided, of course, that the divergences are not *general*, and so equivalent to a rise (or fall) in the scale of mental development.

viduality which is fully realised by its subject, *viz.*, in *the consciousness of personality.*

VALUE OF INDIVIDUALITY. This is not the place to discuss the worth of individuality (within normal limits). It is for ethics to determine this point. It may be enough to say that its value is still greatly underrated, whether we consider it in relation to its conscious possessor, or in relation to the community of which its possessor is a member. That an abiding consciousness of personal distinction, of having thoughts, aims, different from those of others, of living out a life which has never been lived out before, is one of the great constituents in the higher kind of human happiness, is a truth which, in spite of the writings of J. S. Mill and others, has yet to be learned by many.[1] It is still more certain that even the most civilised communities—as represented by their governments at least—have no adequate appreciation of the importance, for a nation's well-being and prospect of advance, of encouraging in every possible way among its citizens individual variety of mind and character.

EDUCATION AND INDIVIDUALITY. The educator has to reckon with the fact of individual variation, and to determine beforehand what place he shall give it in his plan of mental development.

To begin with, whatever may be his indifference to the value of individuality he is at the outset confronted with the germs of it, sometimes with a very lively and vigorous germ. If he essays to teach all his pupils as if they perceived things and thought about things in exactly the same fashion, he will soon find his way to genuine instruction effectually blocked. As we have seen, the environment only becomes the environment by entering into vital relations with a child's natural tendencies; consequently the teacher only accomplishes his full purpose of instructing a child's mind by adapting his mode of presentation to that child's pre-existing stock of ideas and special intellectual and other tendencies. *The best, that is, the most effective, education is thus necessarily recognisant of individuality.*

It must, however, be conceded that where individuality is discouraged or resolutely ignored, something may be done towards diminishing and even killing it. The levelling mode of teaching, which insists on all children learning the same things in the same order and according to precisely the same methods of stating, illustrating and explaining, will undoubtedly tend to plane down young minds

[1] See especially Mill's chapter, "Individuality as One of the Elements of Well-being," in his essay *On Liberty*.

to one pattern, and so the question becomes, How ought a teacher to comport himself in relation to a child's individual impulses, tastes and capabilities? In spite of the neglect of individuality in schools—more especially in elementary schools with their big classes—we may hope that teachers are beginning to discern the value not only of preserving but of fostering and developing all that is healthy and good in a child's mental peculiarities.

This fostering of individuality must set out with *a painstaking investigation of the individual child's existing capabilities, tastes and impulses.* The recent development of experimental tests referred to above has made such methodical inspection possible. These investigations should be renewed from time to time in order to see how the range of individualising character varies under the process of educational development.

When the teacher has thus made clear to himself what sort of minds he has to act upon he will proceed *to modify his typical plan of culture.* Even at the beginning, in the home or the kindergarten, a teacher who knows her pupils will show her respect for individuality by giving this bit of work to one child, putting this particular question to that child, and so forth. Later on, when the preponderant lines of capability and interest get more clearly marked, specialisation of lines of work will be gradually introduced. Outside this more direct action upon individuality of the course and manner of instruction there may be a less direct fostering of it by handing over now and again a half-hour to a self-chosen occupation, and by encouraging a child to develop his own special aptitudes in the freer hours spent at home. How far the general plan of intellectual culture should go in the direction of self-adjustment to individual tastes and capabilities is still a moot point. A certain range of studies and interests is no doubt desirable for every normally endowed child who is to participate in the great legacy of human culture. Not only so, as Herbart has well shown, a certain area of intellectual instruction is needed in order to the development of individuality itself; for the study of a new subject may be the means of bringing to light an undiscovered special aptitude. It may be pointed out, however, that the awakening of an intelligent interest in all the great directions of human thought and activity, such as science and literature, does not necessarily mean that we should teach the same particular group of subjects to all children. And in any case we should be careful, just so far as this need of a uniform course of study is necessary, to bring each part of it into vital relation with the individual's special capabilities and feelings. For the rest the

teacher will do well to get rid as soon as possible of the false and baneful idea that the appearance of special strength of intelligence in a particular direction should be left to take care of itself, and that his business is to level up the whole mind by working away on what is naturally defective.

With respect to the culture of the feelings supplied by literature and art, nothing need be added to what has been said above. In this department, as we have seen, any intelligent plan of education must not only allow for diversity of taste but directly encourage it—always within due limits.

It is in the formation of the *good will* or the moral character that the problem of finding room for individuality within the typical plan of development becomes most difficult.

A little thought will, however, show that there is no insuperable difficulty here. While the ethical end insists upon a certain *conformity* in human action it does not insist upon *uniformity*. Not to speak of that region of "free" action, where a person is allowed to act as an individual, as, for example, in choosing his books, his friends, and his future career, moral action itself in the narrower sense of the term gives a certain play to individual preferences. As has been suggested above, diversity of stations and needs imposes a certain diversity of conduct. Thus some persons, owing to the possession of a weak organ, have to exercise more of the virtue of temperance than others, some who are exceptionally sensitive to pain to exercise more endurance than others, and so forth. Not only so, the possession of a particular moral disposition in a preternatural degree of strength imposes a kind of special duty on its subject. A person who has quick sympathies, and a happy way of expressing them, is specially *called upon* to show sympathy. Thus the moral character itself is not a thing of one set shape, but being a living process within an individual necessarily takes up into itself something of that individual's distinctive attributes.

Here then, too, the educator has to discover and encourage individuality. Moral discipline is no doubt concerned primarily with the production of a common respect for well-defined rules. Yet the intelligent educator will never think of this as the whole of his work; but, taking pains to find out in the case of each child where in the circumstances of the child's life special openings for virtuous effort, and where in the child's individual nature the best germs of moral disposition, lie, will aim especially at fostering these, and so contributing as far as may be to the development of a moral character which is at once typically good and individually fresh and strong.

In less direct ways still—though by no means unimportant ones—the wise educator will seek to promote individuality. The salutary action of a good headmaster on the "tone" of his school should show itself in nothing more clearly than in the restraining of those tendencies to intolerance and persecution of individual dissent from the majority which seem to be inseparable from communities, old and young alike. It is to be hoped that a time may come when the Heads of our Public Schools will think it as much their duty to protect a boy's legitimate liberty of thought and sentiment against the crude and quite conventional "public opinion" of a playground as to insist on his conformity to what has the full claim of an authoritative rule.

REFERENCES FOR READING.

A fuller psychological account of the higher volitional processes may be found in the following: Sully, *The Human Mind*, vol. ii., chap. xviii.; H. Höffding, *Outlines of Psychology*, vii., D; W. James, *Psychology*, chap. xxvi.

The classification of types of character is discussed by B. Perez, *Le caractère de l'enfant à l'homme;* A. Fouillée, *Tempérament et Caractère;* F. Paulhan, *Les Caractères*, and Th. Ribot, *La Psychologie des Sentiments*, part ii., chap. xii. ff.

On the ethical principles of character and their application to education, the student may consult the following: J. S. Mackenzie, *Manual of Ethics*, chap. xii.; Mrs. Bryant, *Educational Ends*, part i.; S. S. Laurie, *Institutes of Education*, part v.; and Lloyd Morgan, *Psychology for Teachers*, chap. x.

On the action of moral discipline on early character the following may be consulted: J. Locke, *On Education*, especially §§ 32-117; Miss Edgeworth, *Practical Education*, chaps. vii. and ix.; H. Spencer, *Education*, chap. iii.; A. Bain, *Education as a Science*, pp. 100-119; Felkin's *Introduction to Herbart's Science and Practice of Education*, chap. iv., or the larger work, *Science of Education*, by J. F. Herbart (Felkin's translation), bk. iii. Among foreign works the following may be mentioned: Madame Necker, *L'Education Progressive*, i., chaps. iv. and vi.; iii., chap. ii.; and vi., chap. iv.; A. E. Martin, *L'Education du caractère;* H. Marion, *Leçons de Psychologie*, leçons v., ix. and xiv., also his volume, *Leçons de Morale;* E. Rayot, *Leçons de Psychologie*, leçon xix.; Th. Waitz, *Allgem. Pädagogik*, §§ 11-15; F. Dittes, *Grundriss*, 5er Abschnitt; T. Ziller, *Allgem. Pädagogik*, §§ 28, 29; and the article "Charakterbildung" in Rein's *Encyclop. Handbuch der Pädagogik.*

On the relation of education to individuality the student may refer to J. P. Richter, *Levana* (translated by S. Wood), fragment ii.; J. F. Herbart, *The Science of Education* (Felkin's translation), book i., chap. ii.; F. Queyrat, *Les caractères et l'éducation morale;* and the article "Individualität" in Rein's *Encyclop. Handbuch der Pädagogik.*

In connection with the bearing of individuality on education the student would do well to consult some work on the observation and classification of children's defects, such as the following: Dr. F. Warner, *The Children, How to Study Them*, and *Lectures on the Growth and Means of Training the Mental Faculty;* three articles on "Mental Defect and Disorder from the Teacher's Point of View," by Professor J. Royce, American *Educational Review*, 1893; Emminghaus, *Die psychische Störungen im Kindesalter;* and the article "Kinderfehler" in Rein's *Encyclop. Handbuch der Pädagogik.*

INDEX.

INDEX.

INITIUM SAPIENTIÆ TIMOR DOMINI
ABERDEEN UNIVERSITY PRESS